

**MULTI CONCEPT 2B**  
**TN/TW CHASSIS**  
**(100 Hz, 4:3/16:9)**

**TV**  
2002

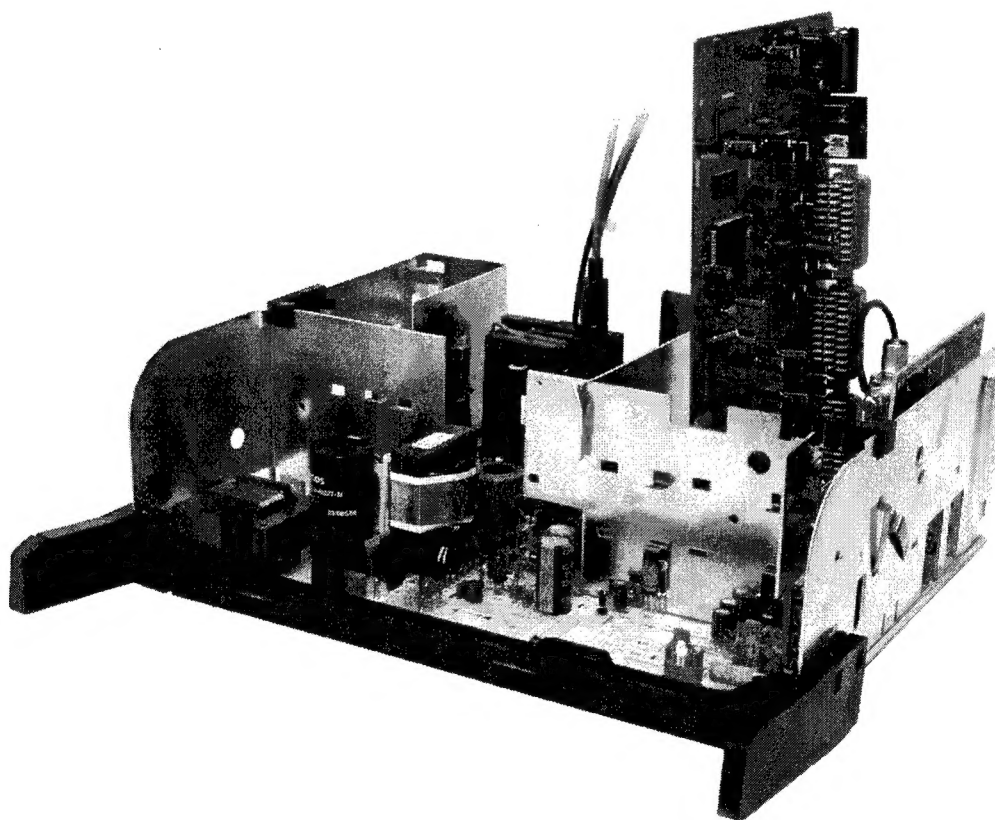
- ⒼⒷ Service manual
- Ⓓ Service-Manual

***universum***

FT7120  
FT7121

Prod.-Nr. 867.510 0  
Prod.-Nr. 528.112 6

TN71V3RUHBB  
TW82X6RUACM



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## Repair instructions

Service and repair work must be performed only in accordance with the existing safety regulations!

Where a high current or a mechanical stress exists solder connections have been strengthened by using eyelets. Such a connection must not be left without an eyelet. Wiring has an effect on safety and EMC (Electro-Magnetic Compatibility). Therefore wires must be maintained in their original positions.

### X-RAY REGULATIONS:

The picture tube type and the maximum permissible high-voltage ensure that the X-ray intensity of the receiver remains far below the permissible value. The high-voltage must not exceed the value mentioned on the type label. The high voltage is within the permissible limits when the operating voltage (U1) of the horizontal deflection stage is accurate. Refer to the section "Service adjustments".

### ESD Warning

The receiver contains components that are sensitive to electrostatic discharge (ESD). Any servicing or repair work must be done in an environment where the components will not be subjected to ESD. Use a special grounding device!

### Surface-Mounted Device (SMD)

SMD's are glued and soldered. In order not to damage the P.C.B e.g. when replacing ICs and similar components with many soldering points, special tools are required when servicing SMD's.

### Changes

The manufacturer reserves the right to change the design and specification without prior notice.



## Reparatur-Anweisung

Service- und Reparaturarbeiten dürfen nur in Übereinstimmung mit den gültigen Sicherheitsbestimmungen durchgeführt werden!

Bei bestehendem hohen Stromwerten oder mechanischer Beanspruchung müssen Lötverbindungen durch Ösen verstärkt werden. Eine derartige Verbindung darf nicht ohne Öse ausgeführt werden.

Die Verdrahtung hat Einfluß auf die Sicherheit und die elektromagnetische Verträglichkeit. Daher muß die ursprüngliche Anordnung der Verdrahtung erhalten bleiben.

### RÖNTGENVERORDNUNG

Der Bildröhrentyp und die maximal zulässige Hochspannung stellen sicher, daß die Intensität der Röntgenstrahlen des Fernsehgerätes weit unter dem zulässigen Wert bleibt. Die Hochspannung darf nicht den auf dem Typenschild befindlichen Wert überschreiten. Die Hochspannung liegt im zulässigen Bereich, wenn die Betriebsspannung (U1) der Horizontal-Ablenkstufe genau eingehalten wird. Siehe auch Abschnitt "Service-Einstellungen".

### EGB-Warnung

Das Fernsehgerät enthält Bauteile, die empfindlich auf elektrostatische Entladung reagieren. Alle Service- oder Reparaturarbeiten sind in einer Umgebung durchzuführen, in der die Bauteile nicht elektrostatischer Entladung ausgesetzt sind. Verwenden Sie eine spezielle Erdungsvorrichtung!

### SMD-Bauelement

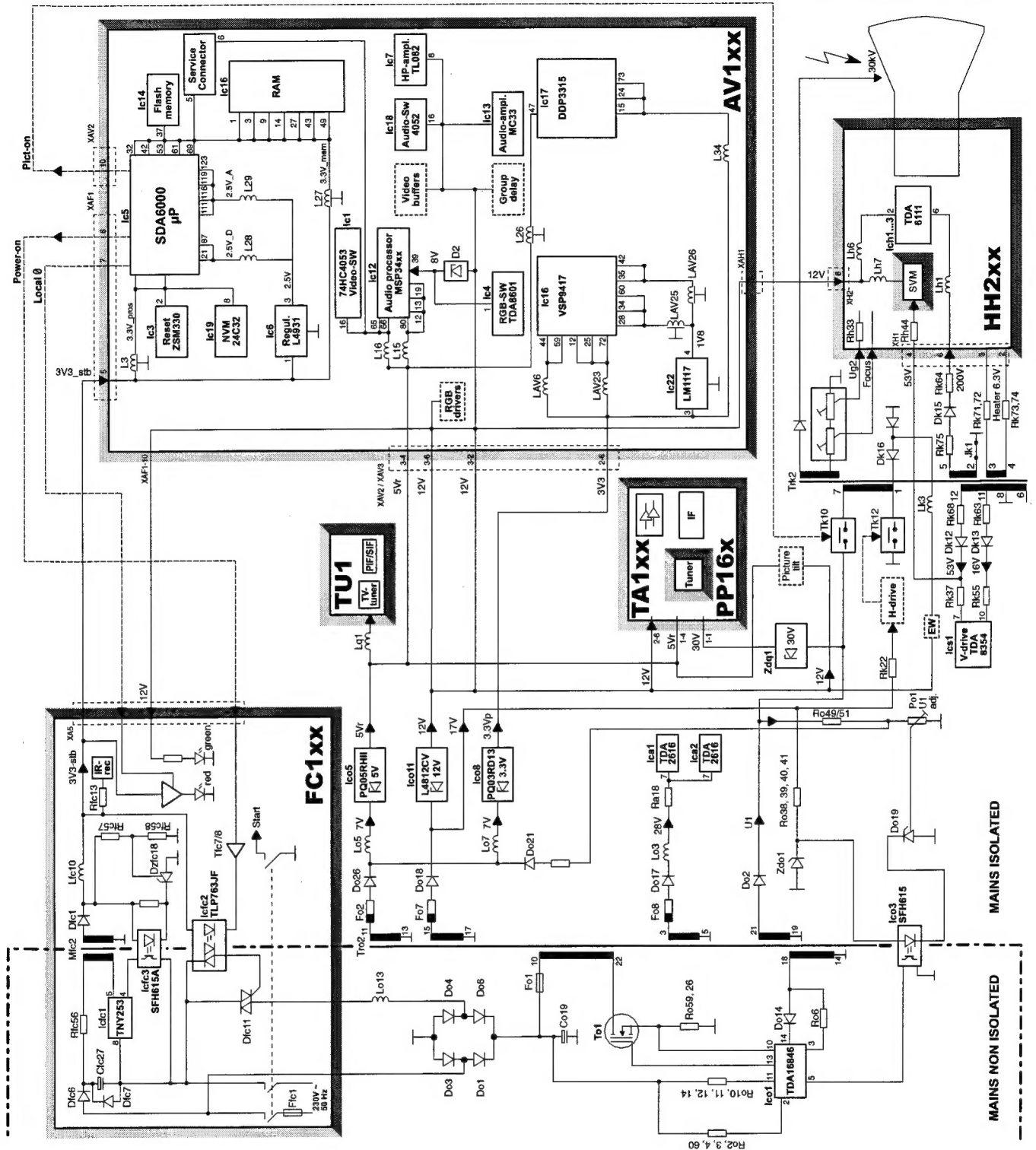
Die SMD's sind geklebt und verlötet. Es sind spezielle Werkzeuge erforderlich, damit bei Austausch von ICs und ähnlichen Bauteilen mit vielen Lötunkten die Leiterplatte nicht beschädigt wird.

### Änderungen

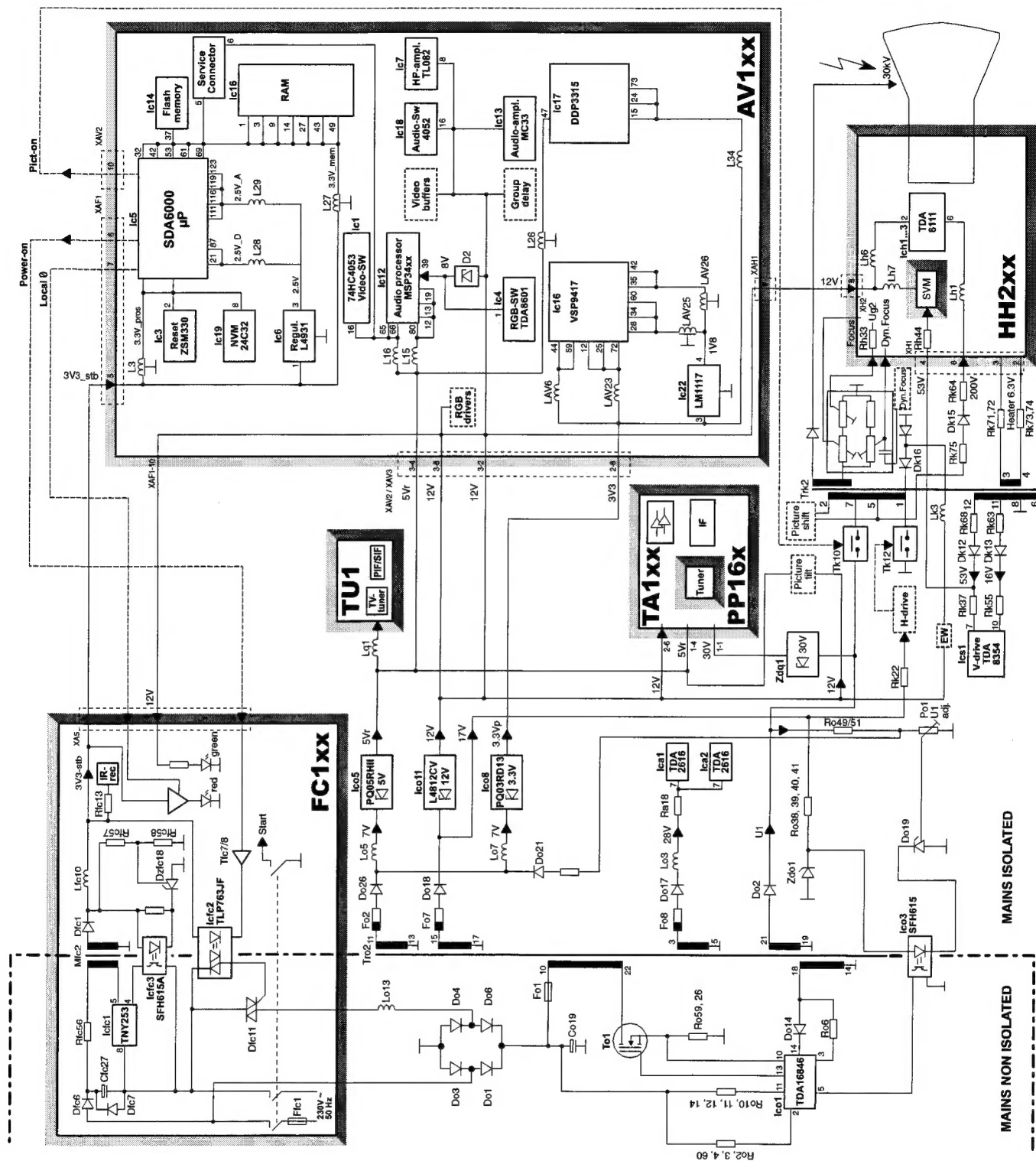
Der Hersteller behält sich das Recht vor, Änderungen in Bauart und Ausführung ohne vorherige Ankündigung durchzuführen.

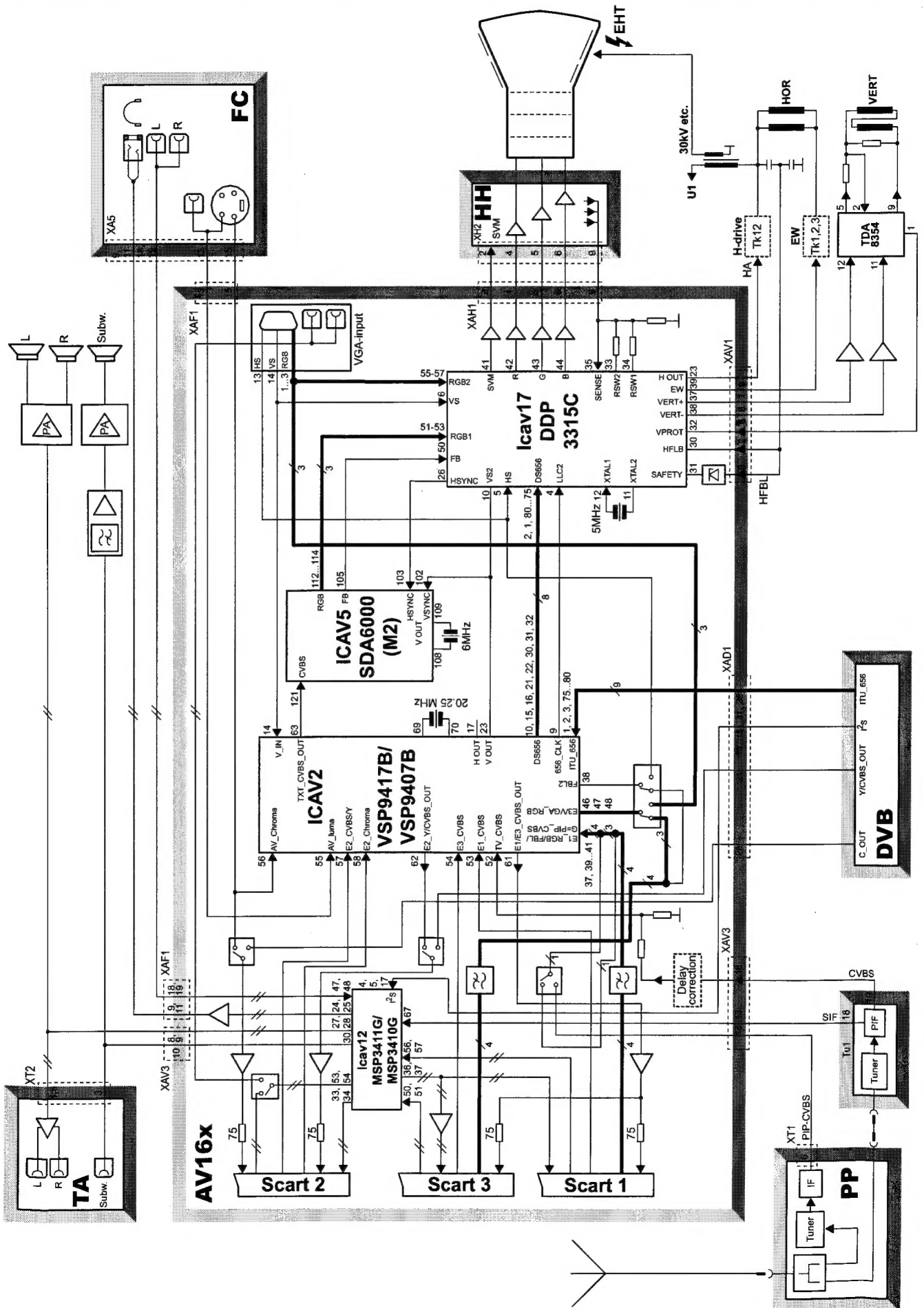
Technical data	Technische Daten	
<p><b>System</b> Multinorm NTSC</p> <p><b>Mains power</b> Consumption <sup>2)</sup> In stand-by</p> <p><b>Frequency range</b></p> <p><b>Sound output (RMS)</b> Subwoofer <sup>1)</sup></p> <p><b>Connections on the front panel</b> Headphones Audio/Video</p> <p><b>Connections on the rear panel</b> Audio/Video</p> <p>Antenna</p> <p>Audio output right/left subwoofer</p> <p>VGA input <sup>1)</sup></p> <p>VGA audio input <sup>1)</sup></p> <p><b>Dimensions</b> <sup>3)</sup> (Width x depth x height / weight) 28" V3 4:3 32" X6 16:9</p> <p><b>Specifications are subject to change.</b></p> <p><sup>1)</sup> Not in all models. <sup>2)</sup> Depends on option modules and picture tube. <sup>3)</sup> Approximately.</p>	<p><b>Norm</b> Multinorm NTSC</p> <p><b>Netzanschluß</b> Leistungsaufnahme <sup>2)</sup> In Bereitschaft</p> <p><b>Frequenzbereich</b></p> <p><b>Tonendstufe (RMS)</b> Subwoofer <sup>1)</sup></p> <p><b>Anschlüsse an der Vorderseite</b> Kopfhöreranschluß Audio/Video</p> <p><b>Anschlüsse an der Rückseite</b> Audio/Video</p> <p>Antennenanschluß</p> <p>Audio Ausgang links/rechts subwoofer</p> <p>VGA Eingang <sup>1)</sup></p> <p>VGA Audio-Eingang <sup>1)</sup></p> <p><b>Maße</b> <sup>3)</sup> (Weite x Tiefe x Höhe / Gewicht) 28" V3 4:3 32" X6 16:9</p> <p><b>Änderungen vorbehalten</b></p> <p><sup>1)</sup> Nicht in allen Modellen. <sup>2)</sup> Abhängig von Optionsmodulen und Bildröhre. <sup>3)</sup> Ungefähr.</p>	<p>PAL/SECAM B, G, D, K, K1, L, L', I 3.58 MHz via scart 4.43 MHz via RF / scart</p> <p>195...264 V, 50 Hz 130 W (normal) &lt; 1 W</p> <p>48.25...855.25 MHz</p> <p>2 x 10 W/8 Ω 14 W/8 Ω</p> <p>32...600 Ω, 3.5 mm Audio in: 0...2 V (RMS) Video in: 1 V/75 Ω Y/C in (SVHS)</p> <p>Audio in: 0...2 V/R<sub>in</sub>=1 kΩ Audio out: 0...2 V/R<sub>l</sub> min. 10 kΩ Video in/out: 1 V/75 Ω RGB in: 0.7 V/75 Ω (E1, E3 <sup>1)</sup>) Y/C in (SVHS) (E2)</p> <p>75 Ω</p> <p>0...2 V/10 kΩ (RCA) 0...2 V/10 kΩ 20...180Hz (RMS) (RCA)</p> <p>640 x 480 60 Hz 640 x 350 70 Hz 640 x 400 70 Hz 720 x 400 70 Hz</p> <p>0...2 V (RMS) (RCA)</p> <p>754 x 500 x 565 mm / 33,0 kg 798 x 569 x 595 mm / 57,0 kg</p>

# Block diagram, power supply 4:3



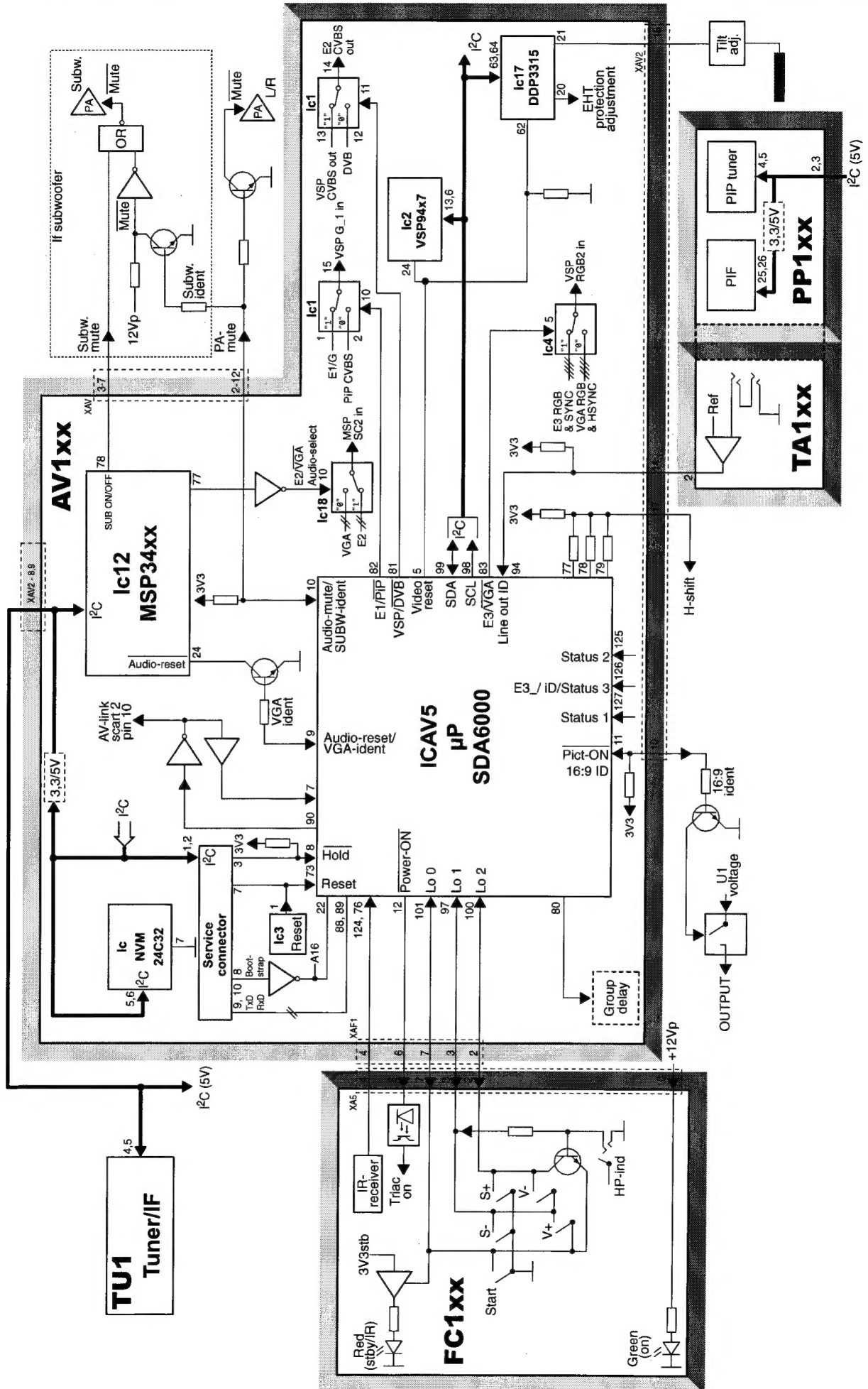
## Block diagram, power supply 16:9







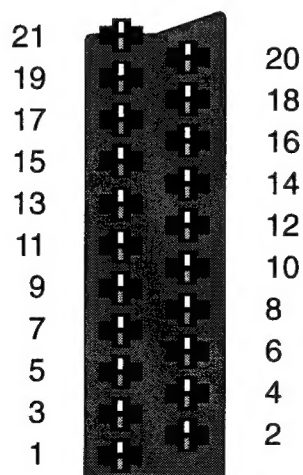
# Block diagram, control signals



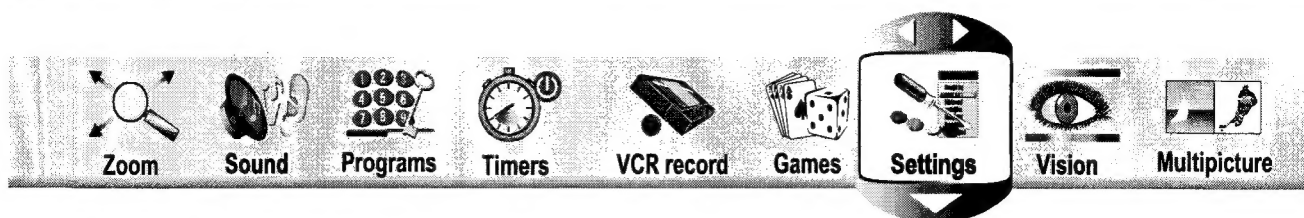


**SCART connector (E1, E2 & E3)**

Pin	SCART 1 (E1)	SCART 2 (E2)	SCART 3 (E3, not in all models)
1	Audio out R, 0.5V (RMS)	Audio out R, 0.5V (RMS)	Audio out R, 0.5V (RMS)
2	Audio in R, 0.5V (RMS)	Audio in R, 0.5V (RMS)	Audio in R, 0.5V (RMS)
3	Audio out L, 0.5V (RMS)	Audio out L, 0.5V (RMS)	Audio out L, 0.5V (RMS)
4	Ground, audio	Ground, audio	Ground, audio
5	Ground, blue	Ground	Ground, blue
6	Audio in L, 0.5V (RMS)	Audio in L, 0.5V (RMS)	Audio in L, 0.5V (RMS)
7	RGB input, blue	S-video chrominance out (copy from front AV-connector)	RGB input, blue
8	Switching voltage	Switching voltage	Switching voltage
	0...2V : no function	0...2V : no function	0...2V : no function
	4.5...7V : 16/9 picture ratio	4.5...7V : 16/9 picture ratio	4.5...7V : 16/9 picture ratio
	9.5...12V : normal picture ratio	9.5...12V : normal picture ratio	9.5...12V : normal picture ratio
9	Ground, green	Ground	Ground, green
10	-	AV-link bidirectional control logical 0: max 0.6V logical 1: min 3.7V	-
11	RGB input, green	-	RGB input, green
12	-	-	-
13	Ground, red	S-video ground (chrominance)	Ground, red
14	Ground	Ground	Ground
15	RGB input, red	S-video input (chrominance)	RGB input, red
16	Switching voltage, RGB blanking	-	Switching voltage, RGB blanking
17	Ground, video	Ground, video	Ground, video
18	Ground	Ground	Ground
19	Video out, 1 Vpp/75	Video out, 1 Vpp/75 S-video out (luminance)	Video out, 1 Vpp/75
20	Video in, 1 Vpp/75 RGB sync in	Video in, 1 Vpp/75 S-video in (luminance)	Video in, 1 Vpp/75 RGB sync in
21	Shield	Shield	Shield



## Operating instructions



### Changing the menu language

1. Press the menu button to select the main menu.
2. Select "Settings" with the arrow buttons (left/right) and press the arrow button down.
3. Select "Language" with the arrow buttons (up/down) and change the menu language with the arrow buttons (left/right).
4. Press the TV button to exit.

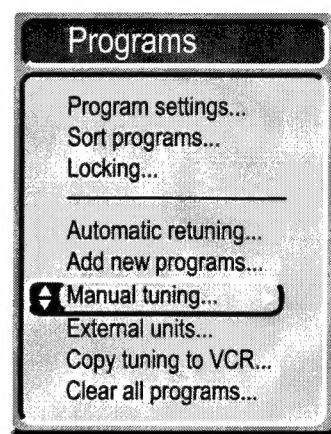
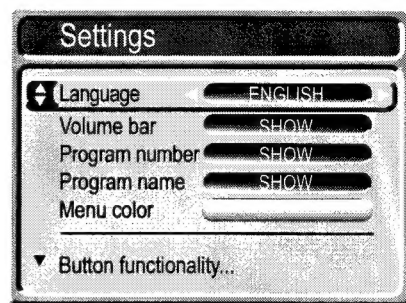
### Manual tuning

1. Select the programme number you want to tune.
2. Press the MENU button.
3. Select "Programs" with the arrow buttons (left/right) and press the arrow button down.
4. Select "Manual tuning" with the arrow buttons (up/down) and press the arrow button right.
5. Press the arrow button right and select "Channel search" with the arrow buttons (up/down).
6. Press the arrow button right to start channel search.
7. Press the TV button and then the arrow button right to confirm.

8. Press the OK button to store
9. Press the TV button to exit.

### APSi (Automatic Programming System)

1. Press the MENU button.
2. Select "Programs" with the arrow buttons (left/right) and press the arrow button down.
3. Select "Automatic retuning" with the arrow buttons (up/down) and press the arrow button right.
4. To retune the channels, press the arrow button right and then the OK button.
5. Press the TV button to exit.

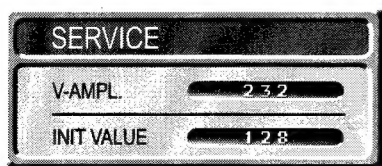


## Service adjustments

### Service mode activation

The receiver must be switched on or be in stand-by mode when activating the service mode.

1. Keep the **▲**- (volume minus) button on **local control unit** pressed and at the same time start entering password: First MENU, TV and "i" with the **remote control**. Release the **▲**- button after the TV button has been pressed. If the receiver is in stand-by mode after the password was entered, switch on the receiver by pressing the TV button.
  2. Activate the service mode by pressing the **i** button.
- The following adjustment menu appears on the screen:



The adjustment number and name, initializing value (down) and adjustment value (up) are shown in the menu.

3. Exit the service mode by pressing the TV button or logout by switching off the receiver with the mains switch.

*Note! Service mode activation stays enabled until the receiver is switched off with the mains switch.*

### Initialization of NVRAM

In case that the NVRAM is replaced, it must be initialized and configured.

1. Activate the service mode in stand-by mode as described in "Service mode activation".
2. Initialize the NVRAM by entering the key code: BLUE, 2, 5, 4 and OK. Initializing will take about 20 s. The receiver switches on automatically when the initializing is ready.
3. Activate the service mode by pressing the **i** button.
4. Press the GREEN button to configure the receiver, see also chapter "Configuration and fault diagnostics". (check that the automatic configuration results in IIC DEV 1-3 and IF OPT bytes are corresponding to the actual configuration of the receiver).
5. Set manual option bytes (TXT OPT, SYS OPT 1 and 2) to correspond to the actual configuration of the receiver. Press the OK button to store the settings.
6. Switch off the receiver by pressing the mains switch.
7. Switch on the receiver by pressing the mains switch and tune one or more tv channels.
8. Activate the service mode and make the necessary service adjustments.
9. Switch off the receiver by pressing the mains switch.

## Service adjustments

### Configuration and fault diagnosis

The receiver must be configured after adding or removing any options. By pressing the GREEN button in service mode, the processor checks the configuration of the receiver and shows the settings on the screen. The configuration can be stored by pressing the OK button.

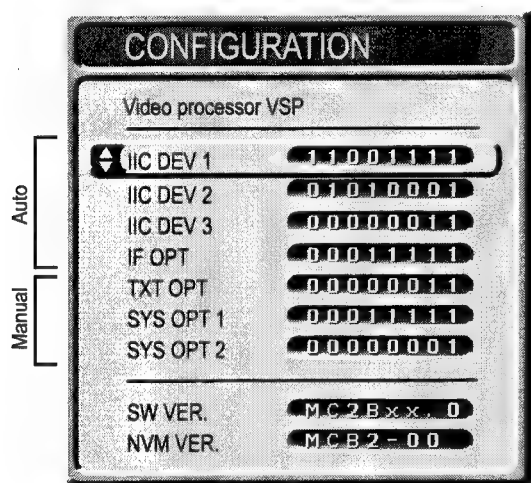
*Note! Disconnect Scart 3 and RCA (line out) cables before configuring the receiver.*

This feature can also be used in fault diagnosis. If an option bit is not '1' when it should be, the IC (or feature) is either not present or faulty.

*Note! IIC DEV 1-3 and IF OPT bytes are configured automatically every time the GREEN button is pressed. TXT OPT, SYS OPT 1 and 2 bytes must be set manually.*

### Changing the option bytes

1. Select the configuration mode by pressing the GREEN button in the service mode.



SW VER. =  $\mu$ P software version.

NVM VER. = NVRAM software version.

2. Select IIC Device byte 1 - 4, Option byte 1 - 5 or Uif flags byte with the arrow buttons (up/down).
3. The name of a responding bit can be seen when using the arrow buttons (up/down and left/right). The selected bit is shown highlighted.
4. Set / clear the bits with the number buttons (0 ... 7).
5. Store the settings by pressing the OK button.
6. Return to the normal service mode by pressing the GREEN button.

### Option byte description

Bit	Description	Setting	'1'	'0'
IIC DEV 1				
		7 6 5 4 3 2 1 0		
		<b>11001111</b>		
0	Video processor VSP		Yes	No
1	Deflection processor DPP		Yes	No
2	TV Tuner PLL		Yes	No
3	TV Tuner IF		Yes	No
4	PIP Tuner PLL		Yes	No
5	PIP Tuner IF		Yes	No
6	Audio processor MSP		Yes	No
7	Subwoofer		Yes	No
IIC DEV 2				
		<b>01010001</b>		
0	Virtual sound MSP		Yes	No
1...3	Free		Yes	No
4	Tube 16:9		Yes	No
5	VGA		Yes	No
6	PIP processor		Yes	No
7	Free		Yes	No
IIC DEV 3				
		<b>00000011</b>		
0	Ext 3		Yes	No
1	Lineouts module		Yes	No
2...7	Free		Yes	No
IF OPT				
		<b>00011111</b>		
0	B/G system in IF		Yes	No
1	I system in IF		Yes	No
2	D/K system in IF		Yes	No
3	L system in IF		Yes	No
4	L' system (Inv I L) in IF		Yes	No
5	NTSC M system in IF		Yes	No
6	Free		Yes	No
7	Free		Yes	No
TXT OPT				
		<b>00000011</b>		
0	TOP enabled		Yes	No
1	FLOF enabled		Yes	No
2...7	Free		Yes	No
SYS OPT 1				
		<b>00011111</b>		
0	E0 (A/V connector) installed		Yes	No
1	E1 RGB disabled on non-E1/E3 programs		Yes	No
2	ACI enabled		Yes	No
3	Carrier mute enabled		Yes	No
4	Loudness enabled		Yes	No
5	Tube type bit 0		Yes	No
6	Tube type bit 1		Yes	No
7	Free		Yes	No
SYS OPT 2				
		<b>00000001</b>		
0	Picture tilt		Yes	No
1	Autostart, Special monitor use		Yes	No
2...6	Free		Yes	No
7	Limited volume		Yes	No

## Service adjustments via I<sup>2</sup>C-bus

### Remote control buttons in service mode

When the receiver is in the service mode you can select the normal TV mode by pressing the TV button and return to the service mode by pressing the i button. The number and the arrow buttons are used for service adjustments. The OK button stores the settings.

### Adjustments for different picture formats

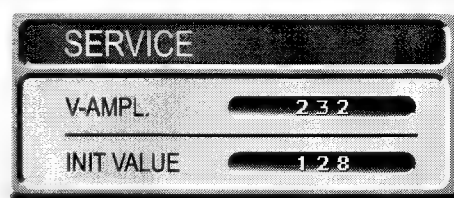
Make all adjustments with a PAL signal unless otherwise mentioned. Make 4:3 set adjustments with normal 4:3 (classic) picture format and 16:9 set adjustments with wide (16:9) picture format. Then make the necessary adjustments with other picture formats/signals. The required adjustments are shown in the table below.

*Note! Check the configuration of the receiver before making the adjustments and make only the necessary adjustments.*

### Making the service adjustment

1. Give a two digit code which determines an adjustment (e.g. 04 = width, see the following tables) with the number buttons or select an adjustment stepping with the arrow buttons (up/down).

*Note! Power supply and Ug2 adjustments must be done before picture geometry adjustments.*



2. Adjust with the cursor buttons (left/right).

3. Store the new value by pressing the OK button.

### Note!

- To avoid incomplete adjustments store each adjustment in the memory immediately after an adjustment has been made.
- If an adjustment has to be made separately for different picture format/signal, select first the normal TV mode by pressing the TV button and select then the desired picture format/signal. Return to service mode by pressing the i button.

### Making the picture geometry adjustments

To help the adjustment of geometry with living picture a red border appears around the deflection area of the picture. It can be switched ON/OFF with the RET-button.

### Picture geometry adjustments

Adjustment	Code	OSD name	4:3 classic/16:9 wide	Progressive scan 50 Hz	VGA 60Hz	VGA 70Hz	Note!
Vertical amplitude	00	V-AMPL.	X	X	X	X	<p>Adjust deflection to center of screen (only in VGA sets).</p> <p>First find the adjustment values where the blanking begins to come over the red area (left/right) and then adjust blanking to the middle of these adjustment values.</p>
Vertical off-centre shift	01	V-SHIFT	X	X	X	X	
Linearity	02	LINEARITY	X	X		X	
Vertical S-correction	03	S-CORR.	X	X		X	
Width	04	WIDTH	X	X	X	X	
Horizontal shift deflection	05	H-SHIFT	X				
Horizontal phase video	06	PHASE	X				
Horizontal blanking	07	HOR BLANK	X				
Parabola	08	PARABOLA	X	X	X	X	
Upper corners	09	CORNER UP	X	X	X	X	
2nd upper corners	10	CORN 2 UP	X	X			
Lower corners	11	CORNER LO	X	X	X	X	
2nd lower corners	12	CORN 2 LO	X	X			
Bow	13	BOW	X	X		X	
Trapezium	14	TRAPEZIUM	X	X		X	
Parallelogram distortion	15	ANGLE	X	X		X	

VGA 60 Hz = Windows mode

VGA 70 Hz = DOS mode

### Other adjustments

Adjustment	Code	OSD name	Note!
Screen grid voltage	16	G2	Adjust the Ug2 until the display shows $140 \pm 20$ .  <i>Note! Don't press the OK button if only Ug2 adjustment is needed.</i>  If the colour temperature adjustment is needed, start it here by pressing the OK button. This restores the default value of codes 14...19 and locks the reference value (20...22) of the highest gun.
Red gain	17	R GAIN	This procedure is necessary e.g. when the picture tube, CRT-module etc. has been replaced. First adjust the GAIN values (white area to 80 nit) and then REF values (dark area to 1.5 nit). Check then GAIN values again and adjust them again if needed. Adjusting: Pressing the RET button changes gray-picture / external-picture and pressing the RED (down) and the YELLOW (up) button changes the contrast value.
Green gain	18	G GAIN	
Blue gain	19	B GAIN	
Red reference	20	R REF.	Adjusting: Pressing the RET button changes gray-picture / external-picture and pressing the RED (down) and the YELLOW (up) button changes the contrast value.
Green reference	21	G REF.	
Blue reference	22	B REF.	
Subcarrier adjust	23	SUB-CARRIER	Start adjustment by pressing right arrow button. Press the OK button to store the value (must be between 29...35).
High voltage limitation	24	EHT PROT	Adjust the value upwards until the TV picture becomes blanked. At the same time the value will be decreased automatically with 60 steps. After that press the OK button to store the adjustment.

### Variable adjustments

Adjustment	Code	OSD name	Note!
BCL (beam current limitation) threshold	25	BCL THRES	Picture tube related default values are given in separate info (CRT dependant adjustments).
BCL gain	26	BCL GAIN	
Threshold for H/V-amplitude EHT corr.	27	EHT THRES	
EHT compensation for H-amplitude	28	EHTH1	
EHT compensation for V-amplitude	29	EHTV1	
H-compensation with higher beam currents	30	EHTH2	
V-compensation with higher beam currents	31	EHTV2	

## Service adjustments

### O Power supply block

#### Supply voltage and protection circuit

1. Set the brightness and the contrast to the normal level. Connect a universal voltmeter to the cathode of Do2.
2. Adjust the **U1 voltage** with **Po1**. The voltage depends on the picture tube type, refer to the section "Variable components".

#### Safety features

Activation of the service mode disables the following features:

- Horizontal safety function (EHT)
- Start-up checking: Video processor and Deflection processor fail to initialize correctly.

### K Horizontal deflection block

#### Horizontal linearity

Adjust with **Lk1**.

#### Focusing

Set the brightness and the contrast to the normal level. Use the crosshatch pattern and adjust the picture for optimum resolution.

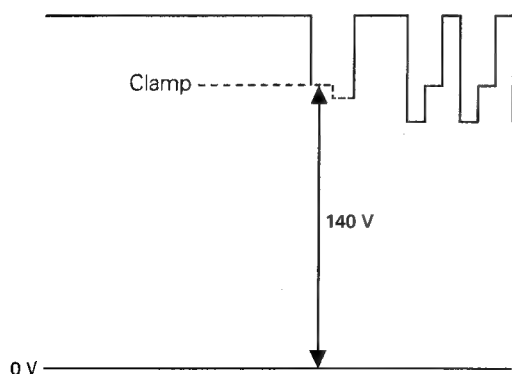
#### (Screen grid voltage) Ug2 voltage

Ug2 voltage can easily be adjusted with help of the on screen display, see section "other adjustments" / screen grid voltage.

#### Ug2 adjusting with oscilloscope:

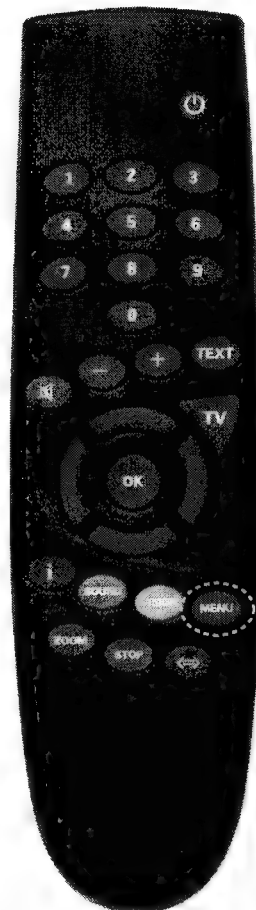
1. Set the brightness and the colour saturation to the normal level and the contrast to minimum.
2. At the end of the vertical blanking, there is a black current measurement pulse (clamp pulse) at **pin 9** of **Ich1**, **Ich2** and **Ich3**. Use an oscilloscope and find the output stage with the highest cut-off (i.e. the highest voltage during the black current measurement pulse).
3. Adjust the voltage of the clamp pulse to **+140 V** with Ug2 (see figure).

*Note! Adjust the voltage with a clamp pulse.*



#### To reset the remote control

1. Remove batteries
2. Reset the remote control by pressing the **BLUE** button approx. 10 seconds and then mount the batteries.





## Bedienungsanleitung



### Ändern der Menüsprache

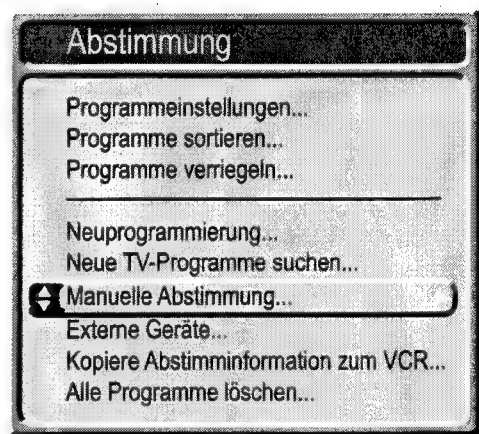
1. Drücken Sie zur Wahl des Hauptmenüs die Menüaste.
2. Wählen Sie "Einstellungen" mit den Pfeiltasten (links/rechts) und drücken Sie die abwärtszeigende Pfeiltaste.
3. Wählen Sie "Sprache" mit den Pfeiltasten (aufwärts/abwärts) und ändern Sie die Menüsprache mit den Pfeiltasten (links/rechts).
4. Beenden Sie den Vorgang durch Drücken der Taste TV.

### Manuelle Abstimmung

1. Wählen Sie die Programmnummer, die Sie abstimmen möchten.
2. Drücken Sie die Taste MENU.
3. Wählen Sie "Programme" mit den Pfeiltasten (links/rechts) und drücken Sie die abwärtszeigende Pfeiltaste.
4. Wählen Sie "Manuelle Abstimmung" mit den Pfeiltasten (aufwärts/abwärts) und drücken Sie die rechte Pfeiltaste.
5. Drücken Sie die rechte Pfeiltaste und wählen Sie "Kanalsuche" mit den Pfeiltasten (aufwärts/abwärts).
6. Drücken Sie die rechte Pfeiltaste, um die Kanalsuche zu starten.
7. Drücken Sie zur Bestätigung die Taste TV und dann die rechte Pfeiltaste.
8. Drücken Sie zur Speicherung die Taste OK.
9. Beenden Sie den Vorgang durch Drücken der Taste TV.

### APSi (Automatisches Programmiersystem)

1. Drücken Sie die Taste MENU.
2. Wählen Sie "Programme" mit den Pfeiltasten (links/rechts) und drücken Sie die abwärtszeigende Pfeiltaste.
3. Wählen Sie "Automatische Neuabstimmung" mit den Pfeiltasten (aufwärts/abwärts) und drücken Sie die rechte Pfeiltaste.
4. Drücken Sie zur Neuabstimmung der Kanäle die rechte Pfeiltaste und dann die Taste OK.
5. Beenden Sie den Vorgang durch Drücken der Taste TV.

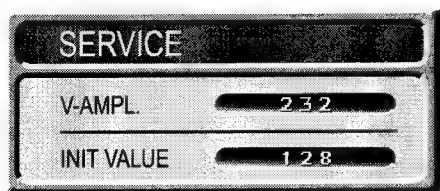


## Service-Einstellungen

### Aktivierung des Servicemodus

Das Fernsehgerät muss bei der Aktivierung des Servicemodus eingeschaltet oder im Stand-by-Modus sein.

1. Halten Sie die Taste- (Lautstärke verringern) an den Bedienelementen am Fernsehgerät gedrückt und drücken Sie gleichzeitig mit der Fernbedienung nacheinander die Tasten MENU, TV und i. Lassen Sie die Taste- nach dem Drücken der Taste TV los. Falls das Fernsehgerät nach Eingabe dieses Codes im Stand-by-Modus ist, schalten es durch Drücken der Taste TV ein.
2. Aktivieren Sie den Servicemodus durch Drücken der Taste-i. Das folgende Einstellmenü erscheint auf dem Bildschirm:



Einstellzahl und -Name, der Initialwert (abwärts) und der Einstellwert (aufwärts) werden im Menü gezeigt.

3. Beenden Sie den Servicemodus durch Drücken der Taste TV oder loggen Sie sich durch Ausschalten des Fernsehgerätes mit dem Netzschalter aus.

*Hinweis: Der Servicemodus bleibt aktiviert, bis das Fernsehgerät mit dem Netzschalter ausgeschaltet wird.*

### Initialisierung des NVRAM

Falls der NVRAM ausgetauscht worden ist, muß dieser initialisiert und konfiguriert werden.

1. Aktivieren Sie im Stand-by-Modus den Servicemodus wie unter "Aktivierung des Servicemodus" beschrieben.
2. Initialisieren Sie den NVRAM durch Eingabe des Tastencodes: Blaue Taste, 2, 5, 4 und OK. Die Initialisierung dauert etwa 20 Sekunden. Das Fernsehgerät schaltet sich automatisch ein, wenn die Initialisierung vollzogen ist.
3. Aktivieren Sie den Servicemodus durch Drücken der Taste-i.
4. Drücken Sie die grüne Taste zur Konfiguration des Fernsehgerätes; siehe auch Kapitel "Konfiguration und Fehlerdiagnose". (Stellen Sie sicher, daß die automatische Konfiguration IIC DEV 1-3 ergibt und die IF OPT-Bytes der aktuellen Konfiguration des Fernsehgerätes entsprechen.)



## Service-Einstellungen

- Stellen Sie die manuellen Optionsbytes (TEXT OPT, SYS OPT 1 und 2) auf die aktuelle Konfiguration des Fernsehgerätes ein. Drücken Sie zur Speichern der Einstellungen die Taste OK.
- Schalten Sie das Fernsehgerät mit dem Netzschalter aus.
- Schalten Sie das Fernsehgerät mit dem Netzschalter ein und stimmen Sie einen oder mehrere Fernsehkanäle ab.
- Aktivieren Sie den Servicemodus und nehmen Sie die nötigen Serviceeinstellungen vor.
- Schalten Sie das Fernsehgerät mit dem Netzschalter aus.

### Konfiguration und Fehlerdiagnose

Das Fernsehgerät muß nach Hinzufügen oder Wegnahme von Optionen konfiguriert werden. Bei Drücken der grünen Taste im Servicemodus überprüft der Prozessor die Konfiguration des Fernsehgerätes und zeigt die Einstellungen auf dem Bildschirm. Die Konfiguration kann durch Drücken der Taste-OK gespeichert werden.

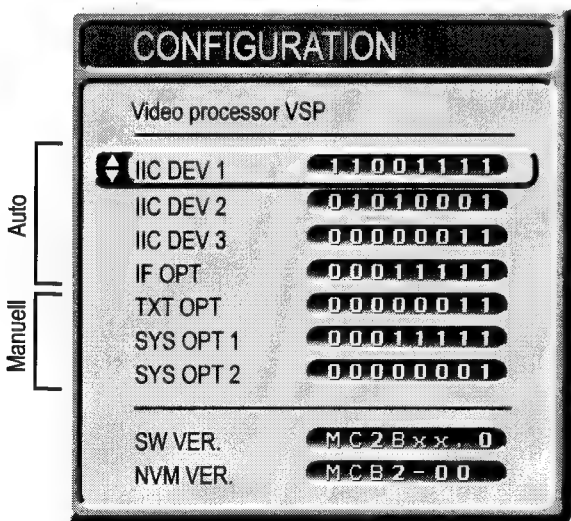
*Hinweis! Entfernen Sie vor der Konfiguration des Fernsehgerätes die Scart 3- und RCA-Ausgangskabel.*

Dieses Feature kann auch bei der Fehlerdiagnose verwendet werden. Falls ein Optionsbit nicht wie erwartet '1' sein sollte, ist der IC oder das Feature entweder nicht vorhanden oder fehlerhaft.

*Hinweis: Die Bytes IIC DEV 1 - 3 und IF OPT werden immer bei Drücken der grünen Taste automatisch konfiguriert. Die Bytes TXT OPT sowie SYS OPT 1 und 2 müssen manuell eingestellt werden.*

### Ändern der Optionsbytes

- Wählen Sie den Konfigurationsmodus durch Drücken der grünen Taste im Servicemodus.



SW VER. = Softwareversion µP.

NVM VER. = Softwareversion NVRAM.

- Wählen Sie den IIC Gerätebyte 1 - 4, den Optionsbyte 1 - 5 oder den UIF-Zustandsbyte mit den Pfeiltasten (auf-/abwärts).
- Der Name eines entsprechenden Bits wird bei Drücken der Pfeiltasten (auf-/abwärts und links/rechts) sichtbar. Das gewählte Bit erscheint hervorgehoben.
- Stellen bzw. löschen Sie die Bits mit den Zifferntasten (0 ... 7).
- Speichern Sie die Einstellungen durch Drücken der Taste-OK.
- Kehren Sie durch Drücken der grünen Taste in den normalen Servicemodus zurück.

### Beschreibung der Optionsbytes

Bit	Beschreibung	Einstellung	'1'	'0'
		7 6 5 4 3 2 1 0		
	<b>IIC DEV 1</b>	<b>11001111</b>		
0	Videoprozessor VSP		Ja	Nein
1	Ablenkprozessor DPP		Ja	Nein
2	TV-Tuner PLL		Ja	Nein
3	TV-Tuner IF		Ja	Nein
4	PIP-Tuner PLL		Ja	Nein
5	PIP-Tuner IF		Ja	Nein
6	Audioprozessor MSP		Ja	Nein
7	Subwoofer		Ja	Nein

	<b>IIC DEV 2</b>	<b>01010001</b>		
0	Virtueller Sound MSP		Ja	Nein
1...3	Frei		Ja	Nein
4	Bildröhre 16:9		Ja	Nein
5	VGA		Ja	Nein
6	PIP-Prozessor		Ja	Nein
7	Frei		Ja	Nein

	<b>IIC DEV 3</b>	<b>00000011</b>		
0	Ext 3		Ja	Nein
1	Ausgangsmodule		Ja	Nein
2...7	Frei		Ja	Nein

	<b>IF OPT</b>	<b>00011111</b>		
0	B/G -System im IF		Ja	Nein
1	I-System im IF		Ja	Nein
2	D/K-System im IF		Ja	Nein
3	L-System im IF		Ja	Nein
4	L'-System (Inv I L) im IF		Ja	Nein
5	NTSC M-System im IF		Ja	Nein
6...7	Frei		Ja	Nein

	<b>TXT OPT</b>	<b>00000011</b>		
0	TOP aktiviert		Ja	Nein
1	FLOF aktiviert		Ja	Nein
2...7	Frei		Ja	Nein

	<b>SYS OPT 1</b>	<b>00011111</b>		
0	E0 (A/V-Anschluß) installiert		Ja	Nein
1	E1 RGB deaktiviert bei nicht-E1/E3 Programmen		Ja	Nein
2	ACI aktiviert		Ja	Nein
3	Träger für Stummschaltung aktiviert		Ja	Nein
4	Lautstärke aktiviert		Ja	Nein
5	Bildneigung Bit 0		Ja	Nein
6	Bildneigung Bit 1		Ja	Nein
7	Frei		Ja	Nein

	<b>SYS OPT 2</b>	<b>00000001</b>		
0	Bildneigung		Ja	Nein
1	Autostart, Verwendung als Spezialmonitor		Ja	Nein
2...6	Frei		Ja	Nein
7	Begrenzte Lautstärke		Ja	Nein

## Service-Einstellungen über den I2C-Bus

### Tasten der Fernbedienung im Servicemodus

Wenn sich das Fernsehgerät im Servicemodus befindet, kann ein normales Fernsehprogramm durch Drücken der Taste TV gewählt werden. Durch Drücken der Taste i gelangen Sie wieder in den Servicemodus. Die Ziffern- und die Pfeiltasten werden für Serviceeinstellungen verwendet. Die Taste-OK speichert die Einstellungen.

### Einstellungen für verschiedene Bildformate

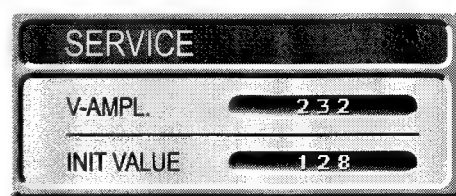
Wenn nicht anders beschrieben, führen Sie sämtliche Einstellungen mit einem PAL-Signal durch. Die Einstellungen für Geräte im 4:3-Format werden im normalen (klassischen) Bildformat 4:3 und die für Geräte im 16:9-Format im breiteren Bildformat 16:9 vorgenommen. Führen Sie dann die nötigen anderen Bildformat- und Signaleinstellungen durch. Die nötigen Einstellungen werden in der Tabelle unten gezeigt.

*Hinweis:* Überprüfen Sie vor Durchführung der Einstellungen die Konfiguration des Fernsehgerätes und führen Sie nur die nötigen Einstellungen durch.

### Durchführen der Serviceeinstellung

1. Geben Sie mit den Ziffertasten einen zweistelligen Code ein, der eine Einstellung festlegt (z.B. 04 = Weite, siehe folgende Tabellen) oder wählen Sie eine Einstellung mit den Pfeiltasten (aufwärts/abwärts).

*Hinweis:* Einstellungen am Netzteil und für UG2 müssen vor den Einstellungen der Bildgeometrie durchgeführt werden.



2. Nehmen Sie die Einstellung mit den Cursortasten (links/rechts) vor.

3. Speichern Sie den neuen Wert durch Drücken der Taste OK.

#### Hinweis!

- Um unvollständige Einstellungen zu vermeiden, speichern Sie sofort jede Einstellung nachdem diese durchgeführt wurde.
- Wenn eine Einstellung getrennt für verschiedene Bildformate und -Signale durchgeführt werden muß, wählen Sie erst durch Drücken der Taste TV den normalen Fernsehmodus und wählen dann das gewünschte Bildformat und -Signal. Gehen Sie durch Drücken der Taste i in den Servicemodus zurück.

### Einstellungen der Bildgeometrie

Um die Einstellung der Bildgeometrie bei laufendem Fernsehbild zu erleichtern, erscheint an der Ablenkfläche des Bildes ein roter Rand, der mit der Taste RET ein- und ausgeblendet werden kann.

### Einstellungen der Bildgeometrie

Einstellung	Code	Name im Display	4:3 klassisch / 16:9 weit	Schrittweises Abtasten 50 Hz	VGA 60 Hz	VGA 70 Hz	Hinweis!
Vertikale Amplitude	00	V-AMPL.	X	X	X	X	
Vertikale Außermittenverchiebung	01	V-SHIFT	X	X	X	X	
Linearität	02	LINEARITY	X	X		X	
Vertikale S-Korrektur	03	S-CORR.	X	X		X	
Weite	04	WIDTH	X	X	X	X	
Horizontale Ablenkungsverschiebung	05	H-SHIFT	X				Stellen Sie die Ablenkung auf die Bildschirmmitte ein (nur bei VGA-Geräten).
Horizontalphase Video	06	PHASE	X				
Horizontale Austastung	07	HOR BLANK	X				Finden Sie zuerst die Einstellwerte, bei denen die Austastung über die rote Fläche zu treten beginnt (links/rechts) und stellen Sie dann die Austastung auf den Mittelwert dieser Einstellwerte ein.
Parabol	08	PARABOLA	X	X	X	X	
Obere Ecken	09	CORNER UP	X	X	X	X	
Zweite obere Ecken	10	CORN 2 UP	X	X			
Untere Ecken	11	CORNER LO	X	X	X	X	
Zweite untere Ecken	12	CORN 2 LO	X	X			
Bogen	13	BOW	X	X		X	
Trapez	14	TRAPEZIUM	X	X		X	
Parallelogramm-Verzerrung	15	ANGLE	X	X		X	VGA 60 Hz = Windows-Modus VGA 70 Hz = DOS-Modus

**Andere Einstellungen**

Einstellung	Code	Name im Display	Hinweis!
Schirmgitterspannung	16	G2	Stellen Sie Ug2 ein, bis das das Display einen Wert von $140 \pm 20$ zeigt.  <i>Hinweis: Drücken Sie nicht die OK-Taste, wenn nur die Einstellung von Ug2 erforderlich ist.</i>  Ist die Einstellung der Farbtemperatur nötig, beginnen Sie durch Drücken der Taste OK. Dieses stellt die Ursprungswerte der Codes 14...19 wieder her und sperrt den Referenzwert (20...22) der höchsten Elektronenkanone.
Rotverstärkung	17	R GAIN	Dieser Vorgang ist nötig, wenn z.B. die Bildröhre oder das CRT-Modul ausgetauscht worden sind. Stellen Sie zuerst die Verstärkungswerte (weiße Fläche auf 80 nit) und dann die Referenzwerte ein (dunkle Fläche auf 1.5 nit). Überprüfen Sie dann nochmals die Verstärkungswerte und stellen Sie diese - wenn nötig - erneut ein. Einstellung: Drücken der Taste RET verändert das Graustufenbild/ externes Bild und Drücken der roten (abwärts) und der gelben Taste (aufwärts) verändert den Kontrastwert.
Grünverstärkung	18	G GAIN	
Blauverstärkung	19	B GAIN	
Rotreferenz	20	R REF.	
Grünreferenz	21	G REF.	
Blaureferenz	22	B REF.	
Einstellung des Hilfsträgers	23	SUB-CARRIER	Starten Sie die Einstellung durch Drücken der rechten Pfeiltaste. Drücken Sie die Taste OK zur Speicherung des Wertes (er soll zwischen 29 und 35 liegen).
Hochspannungsbegrenzung	24	EHT PROT	Stellen Sie den Wert so hoch ein, bis das Fernsehbild ausgetastet wird. Gleichzeitig wird der Wert automatisch in 60 Stufen verringert. Drücken Sie anschließend zur Speicherung der Einstellung die Taste OK.

**Variable Einstellungen**

Einstellung	Code	Name im Display	Hinweis!
Schwellenwert für Strahlstrombegrenzung	25	BCL THRES	Für Standardwerte der Bildröhre siehe separate Hinweise (CRT dependant adjustments)
Verstärkung für Strahlstrombegrenzung	26	BCL GAIN	
Schwellenwert für H/V-Amplitude (EHT-Korrektur)	27	EHT THRES	
EHT-Kompensation für Horizontalamplitude	28	EHTH1	
EHT-Kompensation für Vertikalamplitude	29	EHTV1	
H-Kompensation bei höheren Strahlströmmen	30	EHTH2	
V-Kompensation bei höheren Strahlströmmen	31	EHTV2	

## Service-Einstellungen

### O Netzteil

#### Versorgungsspannung und Schutzschaltung

1. Stellen Sie die Helligkeit und den Kontrast auf einen normalen Wert ein. Schließen Sie ein Universal-Voltmeter an der Kathode von **Do2** an.
2. Stellen Sie die **Spannung U1** mit **Po1** ein. Die Spannung hängt vom Typ der Bilfröhre ab, siehe auch Abschnitt "Variable Bauteile".

#### Sicherheitsfeatures

Die Aktivierung des Servicemodus setzt folgende Features außer Kraft:

- Horizontale Sicherheitsfunktion (EHT)
- Überprüfung bei Beginn:  
Videoprozessor und Ablenkungsprozessor können nicht korrekt initialisieren.

### O Horizontal-Ablenkeinheit

#### Horizontale Linearität

Mit **Lk1** einstellen.

#### Fokussierung

Stellen Sie Helligkeit und Kontrast auf den normalen Wert ein. Benutzen Sie ein Kreuzschraffurmuster und stellen Sie das Bild auf die optimale Auflösung ein.

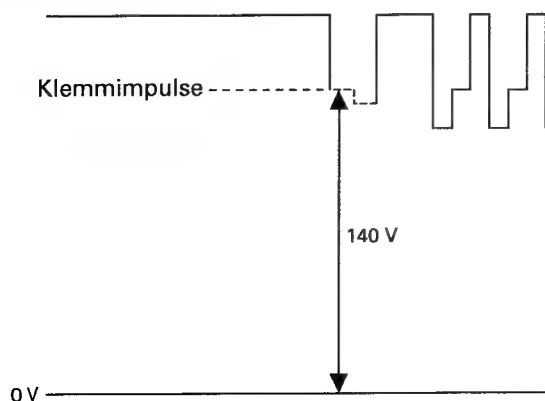
#### (Schirmgitterspannung) Spannung Ug2

Die Spannung Ug2 kann leicht mit Hilfe des Bildschirmanzeige eingestellt werden, siehe Abschnitt "Andere Einstellungen" / Schirmgitterspannung.

#### Einstellung von Ug2 mit dem Oszilloskop

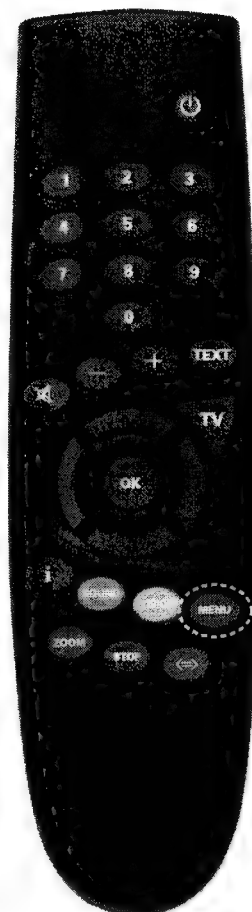
1. Stellen Sie Helligkeit und Farbsättigung auf den normalen Wert und den Kontrast auf den kleinsten Wert ein.
2. Am Ende des vertikalen Austastens ist ein Schwarzstrom-Meßimpuls (Klemmimpuls) an **Pin 9** von **Ich1**, **Ich2** und **Ich3**. Verwenden Sie ein Oszilloskop und ermitteln Sie die Ausgangsstufe mit der höchsten Grenzspannung (entspricht der höchsten Spannung während des Schwarzstrom-Meßimpulses).
3. Stellen Sie die Spannung des Klemmimpulses mit **UG2** auf **+140 V** ein (siehe Abbildung).

*Hinweis: Stellen Sie die Spannung mit einem Klemmimpuls ein.*

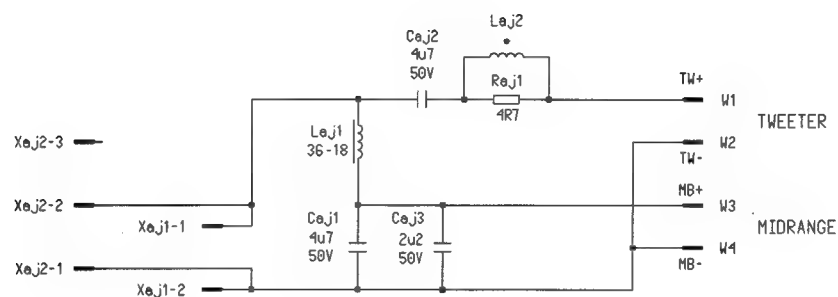
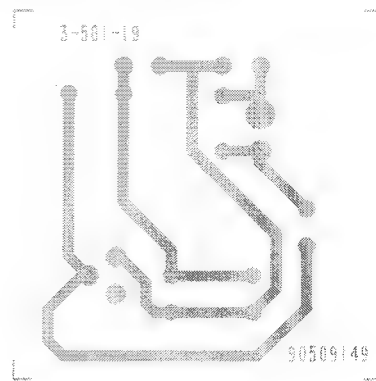
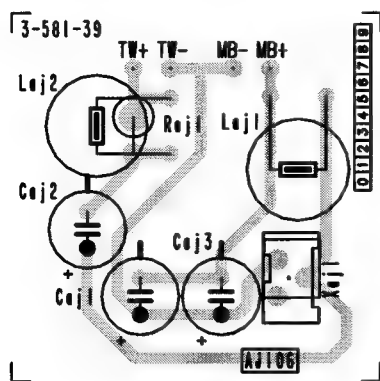


#### Zurücksetzen der Fernbedienung

1. Entnehmen Sie die Batterien.
2. Setzen Sie die Fernbedienung zurück, indem Sie die blaue Taste etwa 10 Sekunden lang drücken. Setzen Sie dann die Batterien wieder ein.

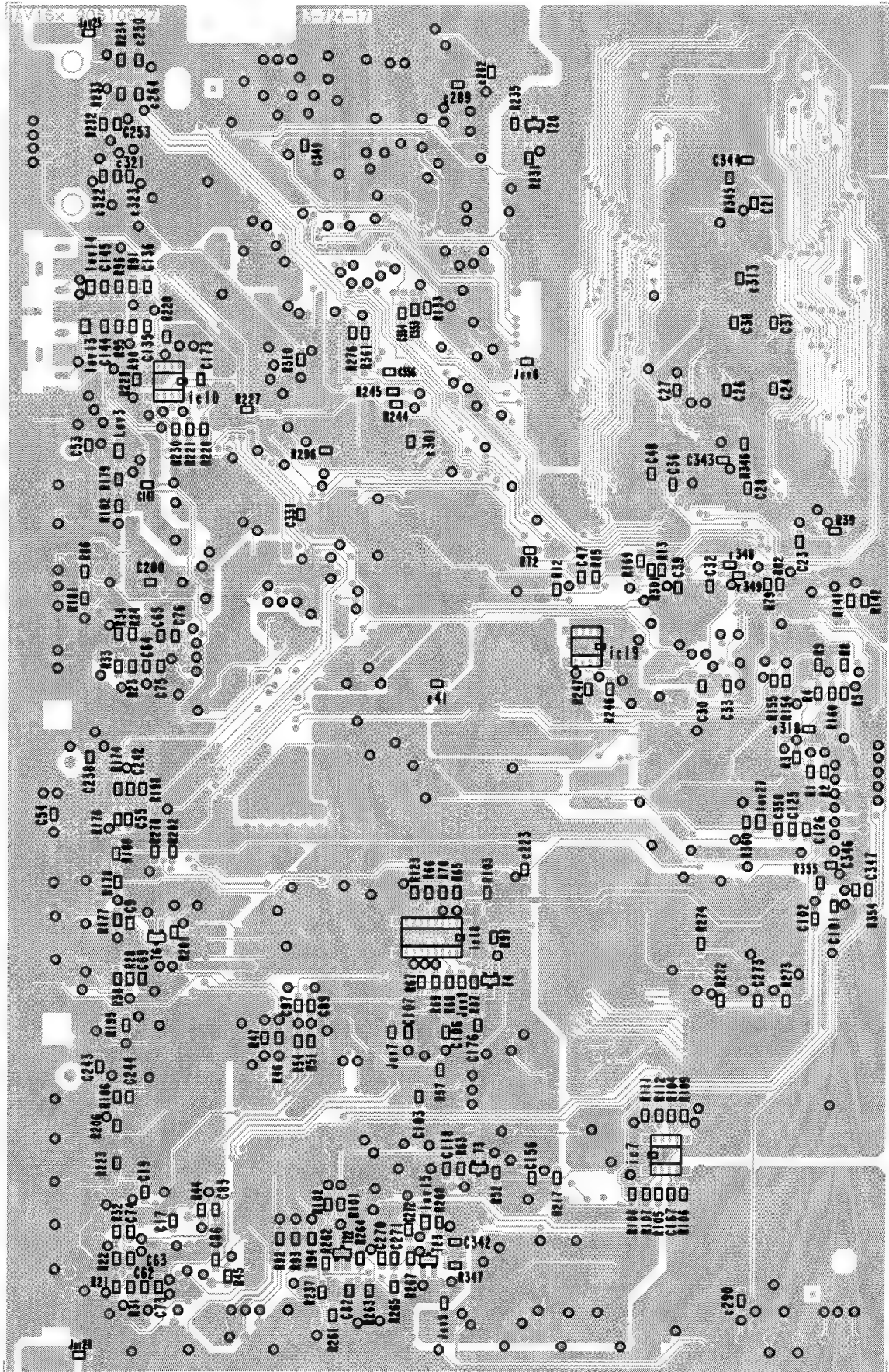


# **AJ106 Crossover network module (version 9)**

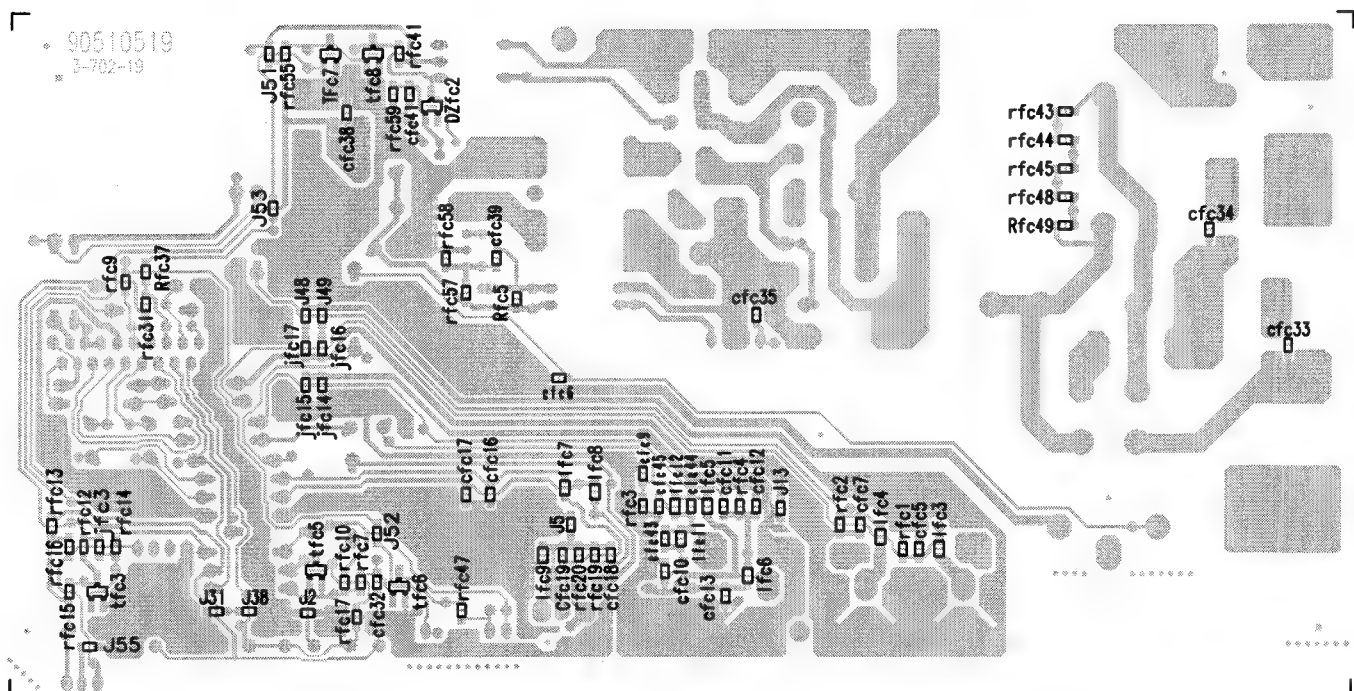




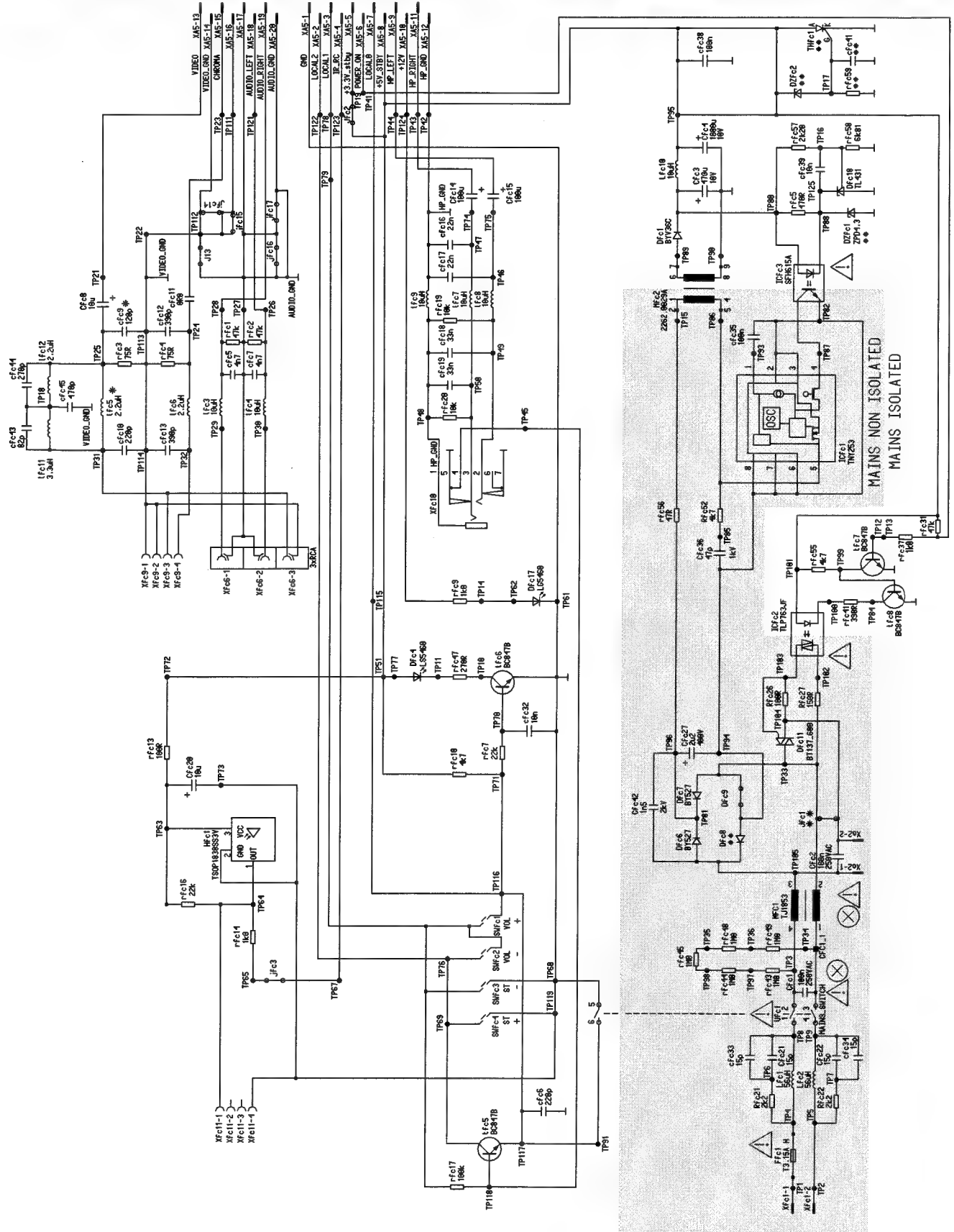




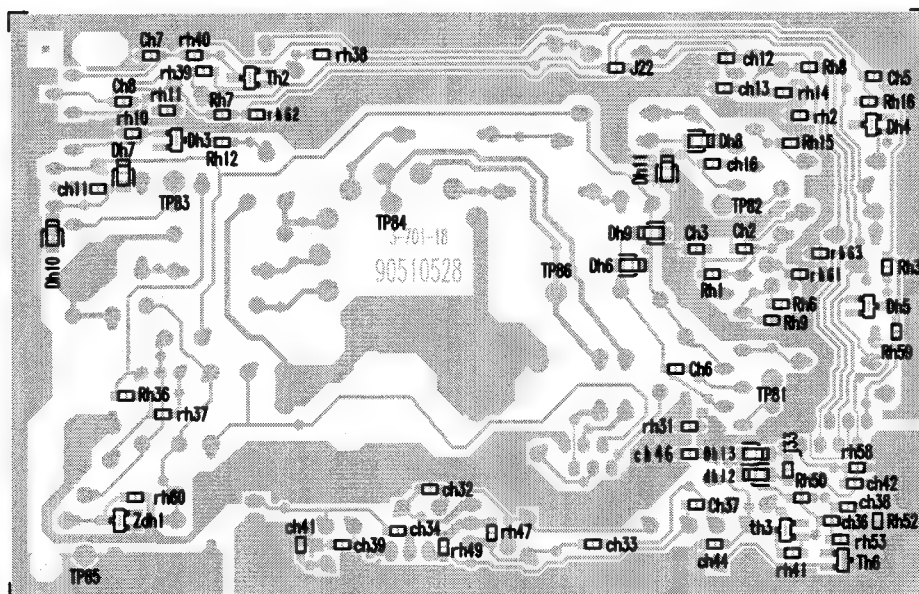
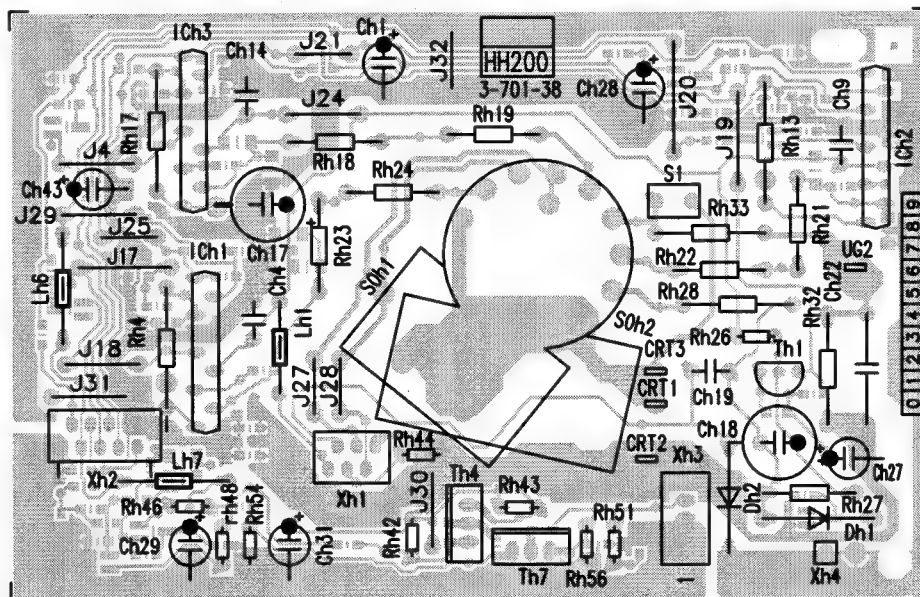




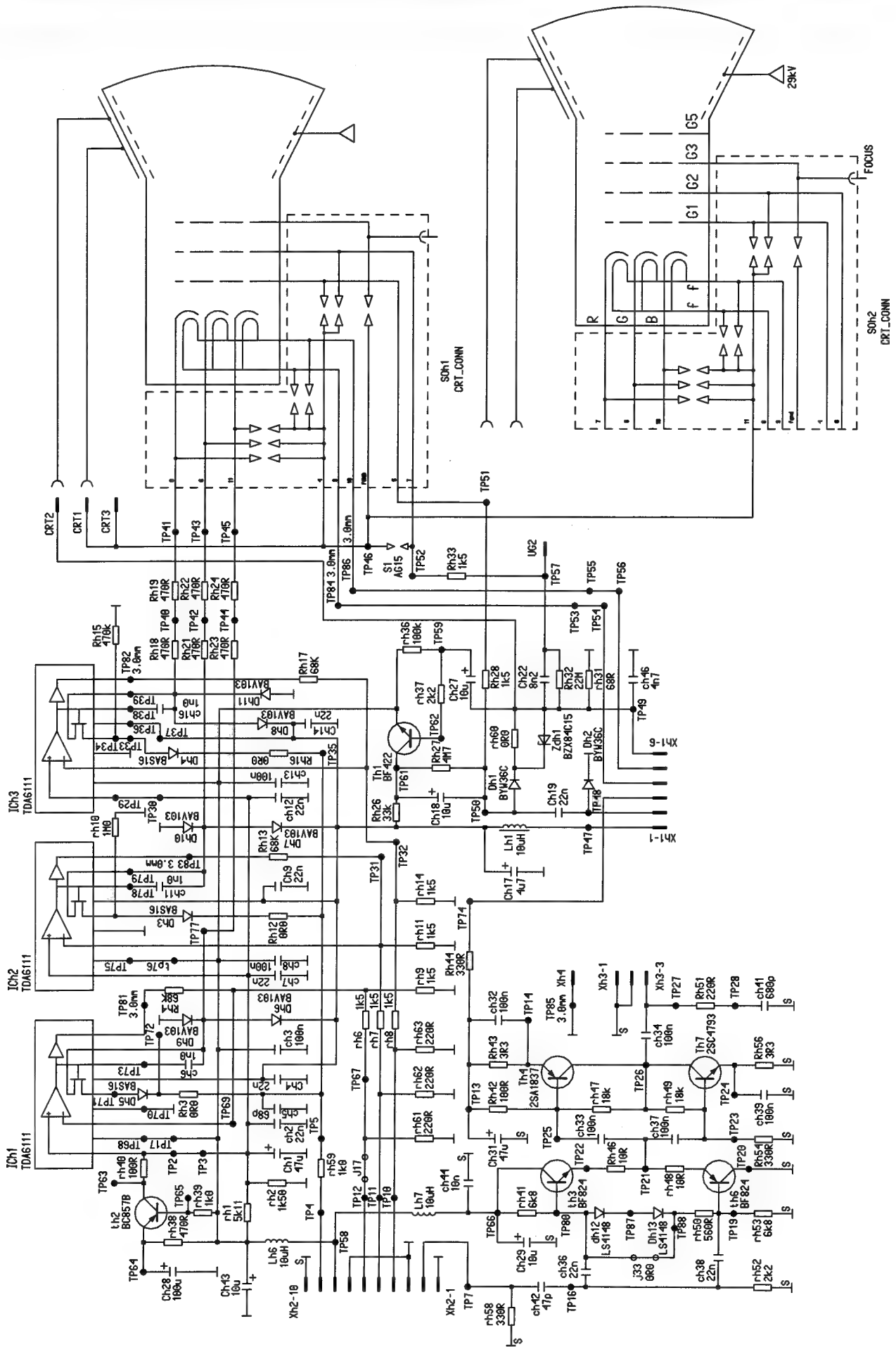
## FC110 Control unit module (version 9)



## HH201 / HH203 CRT-module (version 8)

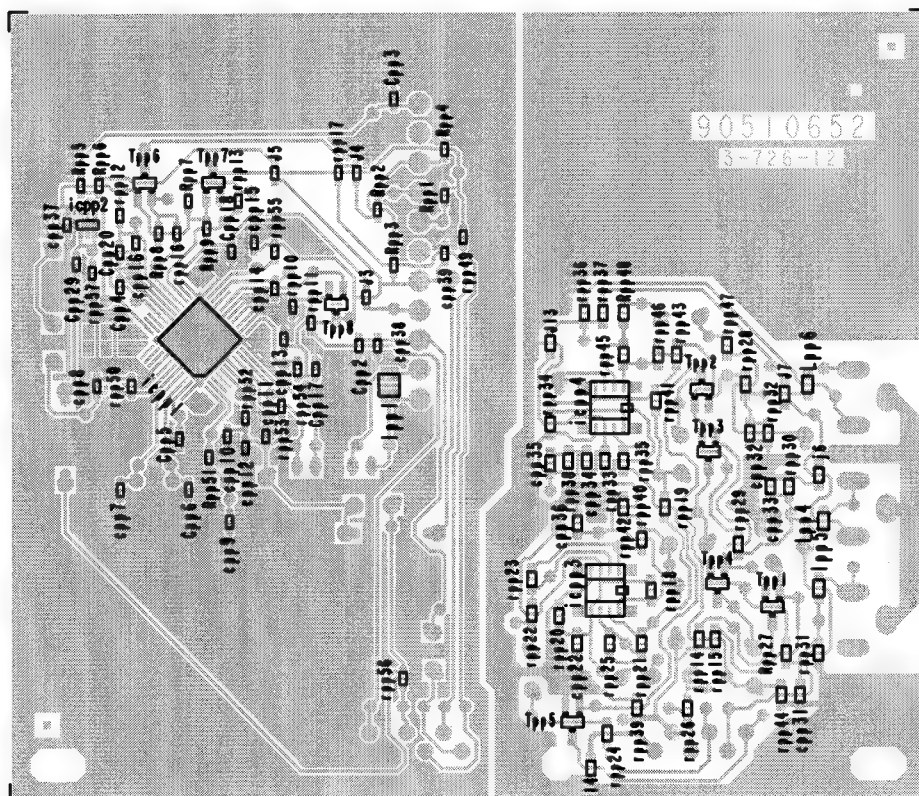
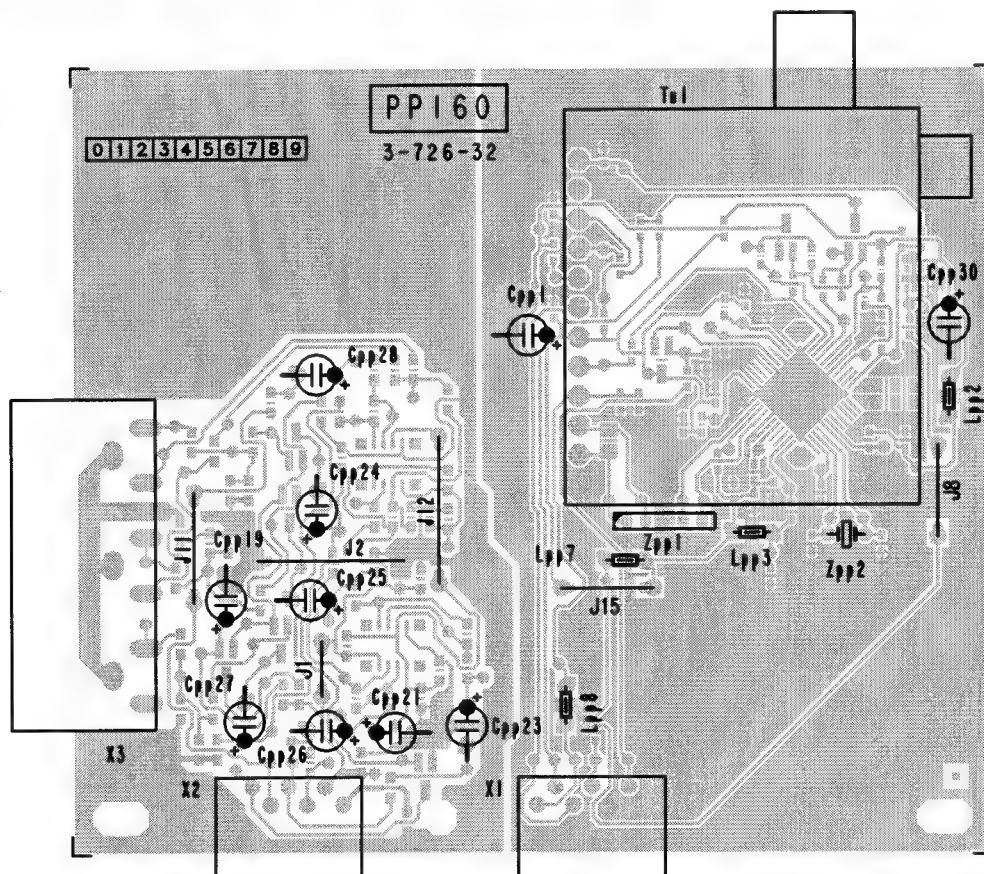


## HH201 / HH203 CRT-module (version 8)

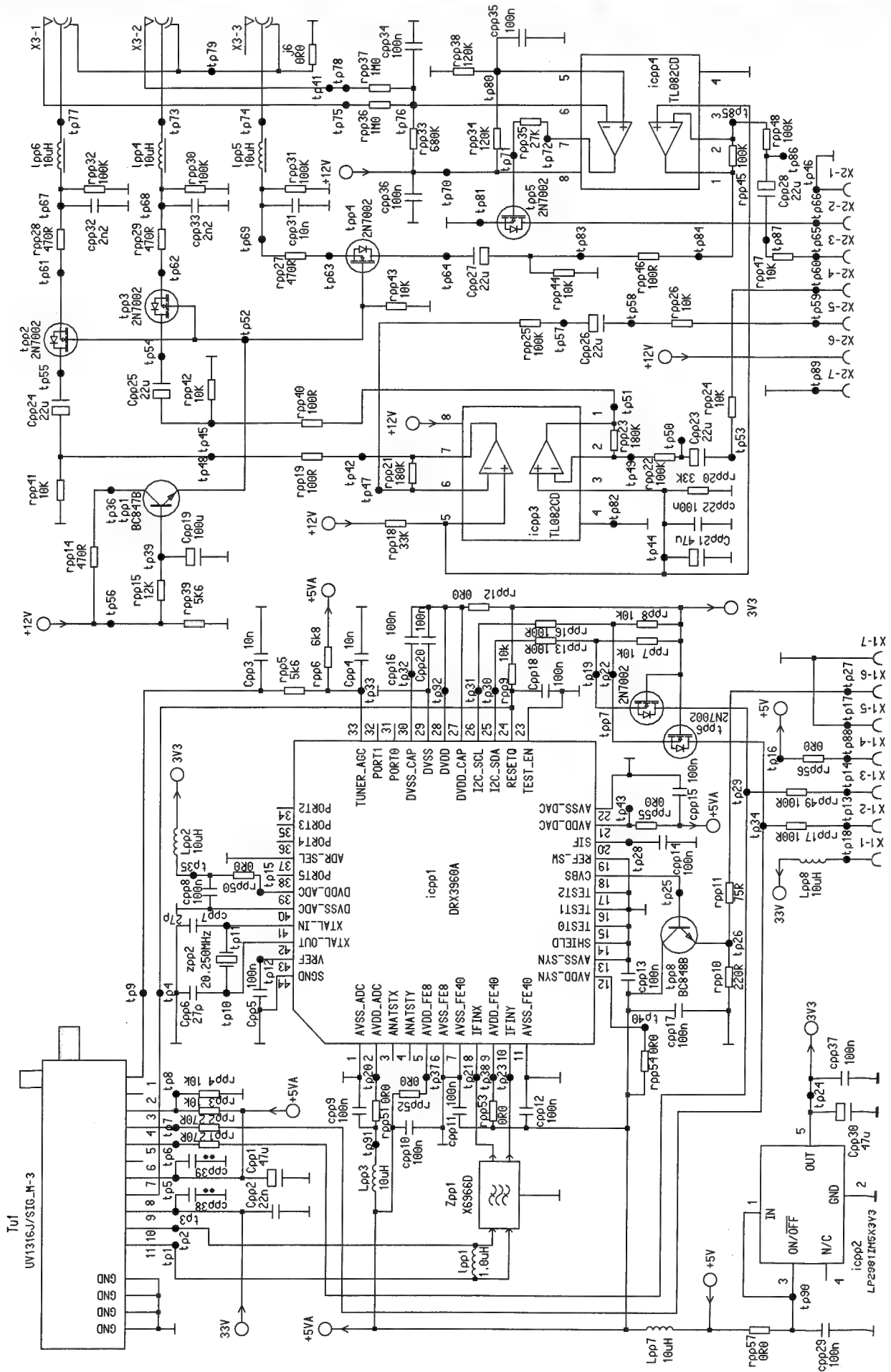




## PP160 Picture in picture module (version 2)



## PP160 Picture in picture module (version 2)



## GB Spare parts

## D Ersatzteile

## Note! Hinweis!

△ Safety components in accordance with existing safety regulations. These components must be replaced only with original parts.

△ Sicherheitsbauteil im Sinn der Sicherheitsbestimmung. Diese Teile dürfen nur durch Originalteile ersetzt werden.

\* Version components

\* Röhrenabhängige Bauteile

## Main board TWARCAA\*

Item Description Order no.

## RESISTORS



PO 1	R TRIM HOR 2K2 0W1	31110970
RA 2, 23, 24, 25	R SMD 10R 0W10	31425810
RA 3, 4, 5, 8, 9	R SMD 33K 0W10	31425840
RA 6	R SMD 560K 0W10	31425896
RA 7	R SMD 680K 0W10	31490059
RA 10, 16	R SMD 100K 0W10	31425844
RA 11	R SMD 3K9 0W10	31425830
RA 12, 17	R SMD 47K 0W10	31425836
RA 13, 14, 15, 30, 31	R SMD 4K7 0W10	31425824
RA 18△	R METOX BK 1R0 4W0	31430013
RA 19	R SMD 10K 0W10	31425833
RA 20	R SMD 1K5 0W10	31425826
RA 21, 22, 26	R SMD 1K0 0W10	31425820
RA 27, 28, 29	R SMD 2K2 0W10	31425828
RK 0	R CARF AX 18K 5% 0W25	31660040
RK 1, 44	R SMD 100R 0W10	31425852
RK 2	R CARF AX 680K 0W25	31660062
RK 3, 5, 10, 12, 56, 57	R SMD 2K7 0W10	31425821
RK 4, 52, 53, 59, 61	R SMD 100K 0W10	31425844
RK 6	R SMD 2K20 0W10	31490098
RK 7, 11, 84, 107	R SMD 10K 0W10	31425833
RK 8, 96	R CARF RAD 15K 5% 0W25	31630033
RK 9	R SMD 430R 0W10	31425879
RK 13	R SMD 3K3 0W10	31425829
RK 15	R SMD 5K1 0W10	31490453
RK 16	R SMD 15K 0W10	31425835
RK 18	R SMD 150R 0W10	31425812
RK 20	R SMD 10R 0W10	31425810
RK 22△, 108△, 110△	R FUS V RAD 2R2 5% 0W25	31860003
RK 23, 25	JUMPER R=15,0 mm	85700150
RK 23-1△, 23-2△, 25-1△, 25-2△, 66-1△, 66-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
RK 30△	HK-RESISTOR 120R 5%	13100232
RK 31, 33, 38, 39, 42	R SMD 2K00 0W10	31490003
RK 32, 49, 91	R SMD 1K0 0W10	31425820
RK 46, 47	R SMD 820R 0W10	31425819
RK 48	R SMD 470R 0W10	31425817
RK 50	R METOX BK 0R47 1W5	31430011
RK 51, 82, 100	R SMD 2K2 0W10	31425828
RK 54	R SMD 4K7 0W10	31425824
RK 55△	R CARF RAD 0R22 5% 0W25	31514506
RK 58	R METOX BK 0R33 1W5	31430010
RK 62	R CARF AX 27R 5% 0W25	31660007
RK 63△, 68△	R FUS V RD 0R1 0W40	31850059
RK 64△	R FUS V RAD 27R 5% 0W25	31860001
RK 65, 67	R CARF RAD 6K8 5% 0W25	31630029
RK 66△	R FUS V AX 0R47 5% 0W5	31850004
RK 69	R SMD 1M0 0W10	31425801
RK 70, 77	R CARF RAD 100K 5% 0W25	31630037
RK 72△, 73△	R FUS V AX 3R0 0W50	31850007
RK 75△	R CARF AX 1R5 5% 0W5	31630014
RK 76△	R FUS V AX 2R2 0W50	31850056
RK 81	R CARF AX 39K 0W25	31660054
RK 83△	R FUS V BLK 390R 10% 1W0	31850002

## Item

## Description

## Order no.

RK 86, 97	R CARF RAD 8K2 5% 0W25	31630030
RK 99	R SMD 8K2 0W10	31425832
RK 101	R SMD 39K 0W10	31425841
RK 102	R SMD 82K 0W10	31425843
RK 105△	R FUS V RD 47R 0W25	31860006
RK 106△	R FUS V RD 330R 0W25	31860005
RK 132△	R FUS V BLK 100R 10% 1W0	31840002
RK 133	R SMD 0R 0W10	31425802
RO 1△	R PTC BLK Rs=9	
	DUAL FOR DEGAUSSING	31930011
RO 2, 3, 60	R SMD 220K 0W10	31490457
RO 4, 51	R SMD 180K 0W10	31490012
RO 5	R SMD 2K7 0W10	31425821
RO 6, 16	R SMD 24K3 0W10	31490451
RO 8	R SMD 6K8 0W10	31425831
RO 9	R SMD 18K 0W10	31425813
RO 10, 11, 12, 14	R SMD 1M0 0W10	31425801
RO 13, 53	R SMD 10K 0W10	31425833
RO 15, 17	R SMD 12R 0W10	31490058
RO 18, 35	R SMD 2K2 0W10	31425828
RO 24	R SMD 1K0 0W10	31425820
RO 25	R SMD 150R 0W10	31425812
RO 26	R METF AX 1R500W6053	31421362
RO 28	R CARF BLK 560R 0W50 AX	31650003
RO 30	R SMD 1K8 0W10	31425827
RO 32△	R METF AX 10M 0W50 HV	31460001
RO 33	R SMD 820R 0W10	31425819
RO 38, 39, 40, 41	R SMD 82R 0W10	31425882
RO 43	R SMD 33K 0W10	31425840
RO 49	R SMD 150K 0W10	31425846
RO 54	R SMD 5K1 0W10	31490453
RO 56	R WRLAC BLK 33K 10% 9W0	31350002
RO 56-1△, 56-2△, 59-1△, 59-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
RO 58	R SMD 100K 0W10	31425844
RO 59	R WRLAC AX 0R18 2W5	31360046
RO 61	R SMD 470R 0W10	31425817
RO 62	R CARF AX 2K2 0W25	31548618
RQ 1	R SMD 22K 0W10	31425837
RQ 3, 4, 5, 6, 7	R SMD 4K7 0W10	31425824
RQ 12	R SMD 330R 0W10	31425857
RQ 14	R SMD 470R 0W10	31425817
RQ 16	R SMD 1K0 0W10	31425820
RS 1, 19	R SMD 2K2 0W10	31425828
RS 2	R SMD 1K5 0W10	31425826
RS 3	R METF RAD 1R54 1% 0W6	31450012
RS 4	R SMD 270K 0W10	31425805
RS 5, 8	R METF RAD 2R15 0W60	31430281
RS 6	R SMD 4K7 0W10	31425824
RS 7	R SMD 15K 0W10	31425835
RS 9	R CARF RAD 68R 5% 0W25	31630042
RS 10, 11	R SMD 12R 0W10	31490058
RS 20	R CARF RAD 33R 5% 0W25	31630022
RS 21	R SMD 10K 0W10	31425833
RS 22	R SMD 47K 0W10	31425836
RS 23	R SMD 12K1 0W10	31490051
RS 24, 27	R SMD 5K11 0W10	31490454
RS 25, 26	R SMD 6K8 0W10	31425831
RS 29	R SMD 18K 0W10	31425813
RS 30	R SMD 0R 0W10	31425802

## CAPACITORS



CA 1, 2	C (M)KT RAD 220N 63V	33127108
CA 3, 6, 11, 12, 13	C CER2 SMD 100N 25V	32190001
CA 4, 14, 17	C ECAP RAD 22U 35V	34540021
CA 5	C ECAP RAD 1U0 63V	34540022
CA 7	C (M)KT RAD 470N 63V	33124503
CA 8, 9	C CER1 SMD 1N0 50V	32125545
CA 10	C CER2 SMD 150N 16V	32525899
CA 15, 19	C CER2 SMD 100N 50V	32536223
CA 18, 20	C ECAP BLK 3300U 35V	34510009



Item	Description	Order no.	Item	Description	Order no.
CA 21, 22, 23	C CER2 SMD 22N 50V	32536221	CO 36	C ECAP BLK 220U 250V HV	34610007
CA 24, 25	C ECAP BLK 470U 35V	34220648	CO 43	C ECAP BLK 1000U 16V	34510004
CA 29	C ECAP BLK 1000U 35V	34220554	CO 45	C ECAP RAD 10U 63V	34540025
CK 1	C CER1 SMD 220P 50V	32125513	CO 49	C CER2 SMD 10N 50V	32536213
CK 2, 41	C CER2 SMD 10N 50V	32536213	CO 58, 59, 64	C ECAP RAD 100U 16V	34223252
CK 3, 6	C ECAP RAD 220U 25V	34229784	CO 69	C (M)KP BLK 33N 1KV	33460016
CK 4	C (M)KT RAD 1U5 63V	33120948	CQ 2	C CER1 SMD 1N0 50V	32125545
CK 5	C (M)KT RAD 100N 63V	33127106	CQ 4	C ECAP RAD 10U 63V	34540025
CK 9	C CER1 SMD 56P 50V	32125526	CQ 5, 6	C CER2 SMD 100N 25V	32190001
CK 10, 28	C (M)KT RAD 220N 63V	33127108	CQ 10	C ECAP RAD 100U 16V	34223252
CK 12	C ECAP RAD 100U 16V	34223252	CS 1	C (M)KT RAD 100N 63V	33127106
CK 13	C CER1 SMD 330P 50V	32125517	CS 2, 6	C CER2 SMD 100N 25V	32190001
CK 14	C ECAP RAD 47U 63V	34540053	CS 3	C (M)KT BLK 47N 100V	33380019
CK 15	C ECAP BLK 2200U 25V	34510005	CS 4	C (M)KP RAD 10N 250V	33450057
CK 16	C (M)KT RAD 22N 400V	33150965	CS 5	C (M)KT RAD 470N 63V	33127123
CK 17△, 23△	C (M)KC BLK 330N 250V	33660001	CS 7	C ECAP RAD 47U 63V	34540053
CK 18, 24	C (M)KP BLK 470P H 1K6V	33460011	CS 8, 10	C CER2 SMD 10N 50V	32536213
CK 19	C ECAP BLK 4U7 250V HV	34610001	CS 9	C CER2 SMD 22N 50V	32536221
CK 20	C (M)KT BLK 100N 250V	33360003	CS 11, 12	C CER2 SMD 4N7 50V	32536210
CK 21	C CER2/3 RAD 2N2 20% 500V	32780003		C CER2 SMD 220N 16V	32525900
CK 22	C CER2/3 RAD 330P 10% 500V	32780002		C CER2 SMD 1N0 50V	32535901
CK 25	C (M)KP BLK 15N H 100V	33460003			
CK 26△	C (M)KP BLK 11N5 3,5 1K6V	33460019			
CK 26-1△, 26-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
CK 27△	C (M)KP BLK 30N 3,5% 630V	33450064			
CK 27-1△, 27-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
CK 29△	C (M)KP BLK 680N 160V	33460004			
CK 29-1△, 29-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
CK 30, 44	C (M)KT RAD 470N 63V	33127123			
CK 30-1△, 30-2△, 36-2△, 36-1△, 32-1△, 32-2△, 33-1△, 33-2△, 17-1△, 17-2△, 18-1△, 18-2△, 23-1△, 23-2△, 24-1△, 24-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
CK 31-1△, 31-2△, 34-1△, 34-2V	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
CK 32	C (M)KP BLK 82N 400V	33450077			
CK 34△	PROPKO 300n 5% 250V	22171302			
CK 36	C (M)KP BLK 1N0 1K6V	33460028			
CK 37, 42	C CER2 SMD 100N 25V	32190001			
CK 38, 39	C ECAP RAD 47U 35V	34229781			
CO 1△, 4△	C CER2/3 BLK 1N0 20% 400VAC Y	32610922			
CO 2△	C (M)KT BLK 220N 400V	33360002			
CO 5, 10, 14, 48	C CER1 SMD 1N0 50V	32125545			
CO 6	C CER1 SMD 56P 50V	32125526			
CO 7-1△, 7-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
CO 8	C (M)KP RAD 1N0 H 100V	33622914			
CO 9	C CER2 SMD 3N3 50V	32536207			
CO 11	C CER1 SMD 330P 50V	32125517			
CO 12, 50, 51, 52, 55, 56, 63, 65	C CER2 SMD 100N 25V	32190001			
CO 13	C ECAP RAD 47U 63V	34540053			
CO 19	C ECAP BLK 220U 450V HV	34540102			
CO 20	C (M)KT RAD 1U0 63V	33124758			
CO 21	C (M)KP BLK 220P 1K6V	33460009			
CO 22	C (M)KT BLK 10N 630V	33380023			
CO 23△	C CER2/3 BLK 1N5 20% 400VAC Y	32960002			
CO 24	C CER2/3 RAD 330P 10% 500V Y	32780002			
CO 25, 26	C CER2/3 RAD 1N0 10% 500V Y	32780004			
CO 29, 54	C (M)KT BLK 100N 250V	33360003			
CO 31	C ECAP BLK 2200U 35V	34226678			
CO 32	C ECAP BLK 1000U 35V	34510010			
CO 33, 39, 40, 41, 42	C (M)KT RAD 100N 63V	33127106			

## TRANSISTORS










TA 1, 2, 4, 5	TR NPN SMD BC847B 45V	36145312
TA 3	TR PNP SMD BC857B 45V	36145412
TK 1, 2, 4, 9	TR PNP SMD BC857B 45V	36145412
TK 3	TR NPN PWR BLK 2SD2012 60V 3A	36270004
TK 3, 12	HEATSINK SPRING	79400021
TK 6, 19, 25	TR NPN SMD BC847B 45V	36145312
TK 8	TR NPN RAD BC637 60V 1A	36220003
TK 10	N-FET PWR BLK BUK457-400B 400V 11A	36370003
TK 11, 15	TR NPN RAD BF422 250V	36125217
TK 12	TR NPN PWR BLK BU2525AF 1K5V 12A	36270003
TK 13	TR PNP RAD BC327-25 45V	36147109
TK 14	TR NPN RAD BC337-25 45V	36147138
TO 1	N-FET BLK STP7NC70Z 700V 6,8A	36370018
TO 1	INSULATOR FOIL FOR 247 1K5V	49000088
TO 1	HEATSINK SPRING	79400021
TO 1-2, 1-3	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
TQ 1	TR NPN SMD BC847B 45V	36145312
TS 1, 3	TR NPN SMD BC847B 45V	36145312
TS 5, 6, 7, 8, 9, 10, 2, 4	TR PNP SMD BC857B 45V	36145412

## DIODES



DA 1	DI SMD LS4148 75V 200mA	3649 0002
DK 1, 2, 3, 5, 6, 21	DI SMD LS4148 75V 200mA	3649 0002
DK 9, 12	DI RECT PWR AX BYV36C 600V 1,6A	3657 5452
DK 11, 14, 19, 20	DI RECT PWR AX 1N4937 600V 1,0A	3657 5353
DK 13	DI AX RECT BYT56J 600V 1,5A	3624 0001
DK 15	DI RECT PWR AX BYV26C 600V 1,0A	3661 0005
DK 16	DI BK RECT BYM357X DAMPER+MODULATOR22	3662 1564
DK 16	HEATSINK SPRING	7940 0021
DK 16-1△, 16-2△, 16-3△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	4193 0009
DO 1, 3, 4, 6	DI RECT PWR AX BY527 1K25V 2A	3661 0001

Item	Description	Order no.	Item	Description	Order no.
DO 1-1△, 1-2△, 2-1△, 2-2△, 3-1△, 3-2△, 4-1△, 4-2△, 6-1△, 6-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009	TRK 3	TRAFO AT4043/67A FOR DYN. FOCUS	45380018
DO 2	DI AX RECT UF5408 1K0V 3,0A	36621568	TRK 3-1△, 3-3△, 3-4△, 3-6△, 5-1△, 5-3△, 5-4△, 5-6△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
DO 2	DIODE COOLING PLATE	81402597	TRO 2△	MAINS TRAFO 2322.0019B	45320063
DO 7-1△, 7-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009	TRO 2-10△, 2-19△, 2-21△, 2-22△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
DO 9, 21	DI SMD LS4148 75V 200mA	36490002			
DO 14	DI SMD BAS20 150V 200mA	36560320			
DO 16-1△, 16-2△, 22-1△, 22-2△, 26-1△, 26-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
DO 17, 18	DI RECT AX BYW98 200V 3A	36575470			
DO 19	IC VREF TL431CLP	37410012			
DO 26	DI AX SCHK SB560 60V 5,0A	36420005			
DO 27	DI RECT PWR AX BA158 600V 0,5A	36561010			
DO 27-1△, 27-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
DS 1	DI SMD LS4148 75V 200mA	36490002			
<b>ZENERS</b>			<b>COILS</b>		
ZDA 2	Z DIODE SMD BZX84A 12V	36770019	TRK 5△	COIL BLK RAD 68uH 15% E/W	45380024
ZDK 1	Z DIODE AX BZX55B 18V	36770008	LK 1	COIL LIN BLK EKM12-136	45161283
ZDK 3, 10	Z DIODE SMD BZX84B 12V	36780008	LK 1-1△, 1-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
ZDK 4	Z DIODE SMD BZX84C 51V	36770035	LK 1-3△, 1-4△, 2-1△, 2-2△, 5-1△, 5-2△, 6-1△, 6-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
ZDK 5, 11	Z DIODE SMD BZX84C 2V4	36780005	LK 2	COIL BLK 280uH FJ1311	45610004
ZDO 1, 11	Z DIODE SMD BZX84B 12V	36780008	LK 3	COIL BLK 1,9mH 14R DRM0630192010K-01	45610018
ZDQ 1	Z DIODE SMD BZX84B 30V	36770033	LK 4	EMI SUPPRES BEAD 3,5x9	45620007
			LK 5	COIL BLK 47uH 7% 1,7A RAD	45620035
			LK 6	COIL BLK 33uH 7% 1,9A RAD	45620037
			LK 7	COIL BLK 33mH 5780301100	45610022
			LO 3, 14, 15, 16	EMI SUPPRES BEAD 3,5x9	45620007
			LO 5, 7	COIL BLK 10uH 1200mA RAD	45571699
			LO 10	COIL AX 10uH 1200mA	45571698
			LO 13△	COIL BLK 43mH 1,2A 250V	45390025
			LO 13-2△, 13-3△, 13-7△, 13-10△, 13-12△, 14-1△, 14-2△, 15-1△, 15-2△, 17-1△, 17-3△, 17-4△, 17-6△, 17-7△, 17-12△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
			LQ 1	COIL BLK 10uH 1200mA RAD	45571699
<b>INTEGRATED CIRCUITS</b>			<b>OTHERS</b>		
ICA 1, 2	IC AUDIO TDA2616 12+12W	37631259	HCK 17_1-1△, 23_1-1△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
ICA 1, 2	HEATSINK SPRING	79400021	HCK 29-1△, 29_1-1△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
ICO 1	IC PWR CONT TDA16846	37450019	HCK 34-1△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
ICO 3△	IC OPTO COUPL SFH615A-2	36950009	HXKT 1-1△, 2-1△, 3-1△, 4-1△, 7-1△, 8-1△, 9-1△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
ICO 5	IC V-REG PQ05RH11 5V 1,5A	37460008	J 4, 45, 54, 61, 89, 121, 131, 137, 138, 151, 166, 173, 185, 193, 195, 200, 211, 219, 324, 327, 329, 331, 332	JUMPER R=15,0 mm	85700150
ICO 5, 8, 11	HEATSINK SPRING	79400021	J 6, 8, 55, 73, 81, 92, 113, 114, 123, 139, 140, 169, 188, 191, 213, 216, 338	JUMPER R=17,5 mm	85700175
ICO 8	IC V-REG PQ3RD13 3V3 1,0A	37460033			
ICO 11	IC V-REG L7812CV 12V 1,5A	37681748			
ICS 1	IC DEFL TDA8354Q/N11/N1E S1	37450017			
ICS 1	HEATSINK SPRING	79400021			
<b>FUSES</b>					
FO 1△	FUSE F2,5A MINIATURE D=8,5	43770004			
FO 1-1△, 1-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
FO 2△, 7△, 8△	FUSE T2,0A MINIATURE D=8,5	43770005			
<b>TRANSFORMERS</b>					
TRK 1	TRAFO 545 01 204 00	45380013			
TRK 2△	DST TRAFO 1372,8016A	45360089			
TRK 2-5△, 2-7△, 2-9△, 2-10△, 2-13△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			
TRK 2-16△, 2-1△, 2-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009			

Item	Description	Order no.	Item	Description	Order no.
J	12, 19, 21, 22, 23, 25, 39, 40, 41, 42, 43, 44, 50, 57, 60, 71, 76, 83, 84, 96, 158, 161, 167, 180, 187, 204, 207, 218, 302, 306, 311, 312, 313, 315, 317, 318, 339	JUMPER R=12,5 mm	85700125	<b>Main board TNBRAAA*</b>	
J	15, 49, 51, 53, 67, 68, 74, 75, 77, 98, 124, 134, 148, 164, 178, 181, 186, 199, 201, 217, 304, 330, 342	JUMPER R=20,0 mm	85700200	<b>RESISTORS</b> 	
J	33, 301, 319, 335, 340, 341, 344	R SMD 0R 0W10	31425802	PK 1△	R POT FOCUS 59M 2W0 31280010
J	93, 100, 103, 108, 142, 146, 147, 163, 179, 194, 206, 208, 210, 212, 215, 303, 305, 308	JUMPER R=10,0 mm	85700100	PO 1	R TRIM HOR 2K2 0W1 31110970
J	145	JUMPER R=11,25 mm	85701125	RA 13, 14, 30, 31	R SMD 4K7 0W10 31425824
J	194-1△, 194-2△, 195-1△, 195-2△, 200-1△, 200-2△, 202-1△, 202-2△, 315-1△, 315-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009	RA 18△	R METOX BK 1R0 4W0 31430013
J	307, 314, 328	JUMPER R= 7,5 mm	85700075	RA 19	R SMD 10K 0W10 31425833
JQ	10	R SMD 0R 0W10	31425802	RA 22	R SMD 1K0 0W10 31425820
TU	1	TUNER FQ1216ME/I V-3	58231067	RA 24, 25	R SMD 10R 0W10 31425810
XA	1	ROW CONN 3-PIN VERT	73190603	RA 27, 28	R SMD 2K2 0W10 31425828
XA	2	ROW CONN 4-PIN VERT	73190604	RK 0	R CARF AX 150K 5% 0W25 31660032
XAV	1	CONN ROW 9-PIN VERT	41710068	RK 1, 44	R SMD 100R 0W10 31425852
XAV	2, 3	CONN ROW 19-PIN VERT	41710073	RK 3, 5, 10, 12, 56, 57	R SMD 2K7 0W10 31425821
XK	3	ROW CONN 5-PIN VERT	41710001	RK 4, 52, 53, 59, 61	R SMD 100K 0W10 31425844
XK	3-1△, 3-2△, 3-3△, 3-4△, 3-5△, 7-1△, 7-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009	RK 5	R SMD 2K20 0W10 31490098
XK	6	CONN HEADER 6-PIN PITCH	41710002	RK 7, 11, 84, 133	R SMD 10K 0W10 31425833
XKT	1	BLADE CONN 2,8MM FOR PCB MALE	41930001	RK 8	R CARF RAD 15K 5% 0W25 31630033
XO	1	ROW CONN 2-PIN VERT LOCK	73184750	RK 9	R SMD 430R 0W10 31425879
XO	1-1, 1-2	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009	RK 13	R SMD 3K3 0W10 31425829
XO	3	CONN ROW 2-PIN VERT	41710212	RK 15	R SMD 5K1 0W10 31490453
XS	1	ROW CONN 3-PIN VERT	73190603	RK 16	R SMD 15K 0W10 31425835
XS	2	ROW CONN 4-PIN VERT	73190604	RK 18	R SMD 150R 0W10 31425812
XT	1, 2	CONN ROW 7-PIN VERT	41710077	RK 20	R SMD 10R 0W10 31425810
		INS SLEEVE FOR CONN BLADE 2,8mm	47310004	RK 22△	R FUS V RAD 2R2 5% 0W25 31860003
		ANTENNA CABLE ASSY 200mm RCA/IEC	47780009	RK 23, 25	JUMPER R=15,0 mm 85700150
△		CABLE ANODE A113817		RK 23-1△, 23-2△, 25-1△, 25-2△, 66-1△, 66-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm 41930009
△		630mm+CHIMNEY CAP	96008869	RK 30△	HK-RESISTOR
△		FOCUS CABLE 410mm	96010220	RK 31, 33, 38, 39, 42	120R 5%LCR0207 13100232
△		FOCUS CABLE 1,2 410MM	96010230	RK 32, 49	R SMD 2K00 0W10 31490003
△		SCREEN CABLE 460mm	96010244	RK 46, 47	R SMD 1K0 0W10 31425820
				RK 48	R SMD 820R 0W10 31425819
				RK 50	R SMD 470R 0W10 31425817
				RK 51, 82	R METOX BK 0R47 1W5 31430011
				RK 54	R SMD 2K2 0W10 31425828
				RK 55△	R SMD 4K7 0W10 31425824
				RK 58	R CARF RAD 0R22 5% 0W25 31514506
				RK 62	R METOX BK 0R33 1W5 31430010
				RK 63△, 68△	R CARF AX 27R 5% 0W25 31650007
				RK 64△	R FUS V RD 0R1 0W40 31850059
				RK 65, 67	R FUS V RAD 27R 5% 0W25 31850001
				RK 66△	R CARF RAD 6K8 5% 0W25 31630029
				RK 69	R FUS V AX 0R47 5% 0W5 31850004
				RK 70, 77	R SMD 1M0 0W10 31425801
				RK 72△, 73△	R CARF RAD 100K 5% 0W25 31630037
				RK 75△	R FUS V AX 3R0 0W50 31850007
				RK 76△	R CARF AX 1R5 5% 0W5 31630014
				RK 81	R FUS V AX 2R2 0W50 31850056
				RK 83△	R CARF AX 39K 0W25 31650054
				RO 1△	R FUS V BLK 390R 10% 1W0 31850002
				RO 2, 3, 60	R PTC BLK Rs=9
				RO 4, 51	DUAL FOR DEGAUSSING 31930011
				RO 5	R SMD 220K 0W10 31490457
				RO 6, 16	R SMD 180K 0W10 31490012
				RO 8	R SMD 2K7 0W10 31425821
				RO 9	R SMD 24K3 0W10 31490451
				RO 10, 11, 12, 14	R SMD 6K8 0W10 31425831
				RO 13, 53	R SMD 18K 0W10 31425813
				RO 15, 17	R SMD 1M0 0W10 31425801
				RO 18, 35	R SMD 10K 0W10 31425833
				RO 24	R SMD 12R 0W10 31490058
				RO 25	R SMD 2K2 0W10 31425828
				RO 26	R SMD 1K0 0W10 31425820
				RO 28	R SMD 150R 0W10 31425812
				RO 30	R METF AX 1R500W6053 31421362
				RO 32△	R CARF BLK 560R 0W50 AX 31650003
				RO 33	R SMD 1K8 0W10 31425827
					R METF AX 10M 0W50 HV 31460001
					R SMD 820R 0W10 31425819

Item	Description	Order no.
RO 38, 39, 40, 41	R SMD 82R 0W10	31425882
RO 43	R SMD 33K 0W10	31425840
RO 49	R SMD 150K 0W10	31425846
RO 54	R SMD 5K1 0W10	31490453
RO 56	R WRLAC BLK 33K 10% 9W0	31350002
RO 56-1△, 56-2△, 59-1△, 59-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
RO 58	R SMD 100K 0W10	31425844
RO 59	R WRLAC AX 0R18 2W5	31360046
RO 61	R SMD 470R 0W10	31425817
RO 62	R CARF AX 2K2 0W25	31548618
RQ 1	R SMD 22K 0W10	31425837
RQ 3, 4, 5, 6, 7	R SMD 4K7 0W10	31425824
RQ 12	R SMD 330R 0W10	31425857
RQ 14	R SMD 470R 0W10	31425817
RQ 16	R SMD 1K0 0W10	31425820
RS 1	R SMD 2K2 0W10	31425828
RS 2	R SMD 1K5 0W10	31425826
RS 3	R METF RAD 1R54 1% 0W6	31450012
RS 4	R SMD 270K 0W10	31425805
RS 5, 8	R METF RAD 1R10 0W60	31450013
RS 9	R CARF RAD 27R 5% 0W25	31630021
RS 10, 11	R SMD 12R 0W10	31490058
RS 13, 14, 15	R CARF RAD 820R 5% 0W25	31630044
RS 21	R SMD 10K 0W10	31425833
RS 22	R SMD 47K 0W10	31425836
RS 23	R SMD 12K1 0W10	31490051
RS 24, 27	R SMD 5K11 0W10	31490454
RS 25, 26	R SMD 6K8 0W10	31425831

## CAPACITORS










CA 1, 2	C (M)KT RAD 220N 63V	33127108
CA 8, 9	C CER1 SMD 1N0 50V	32125545
CA 13	C CER2 SMD 100N 25V	32190001
CA 17	C ECAP RAD 22U 35V	34540021
CA 18, 20	C ECAP BLK 3300U 35V	34510009
CA 19	C CER2 SMD 100N 50V	32536223
CA 21, 22	C CER2 SMD 22N 50V	32536221
CA 24, 25	C ECAP BLK 470U 35V	34220648
CK 1	C CER1 SMD 220P 50V	32125513
CK 2, 41	C CER2 SMD 10N 50V	32536213
CK 3, 6	C ECAP RAD 220U 25V	34229784
CK 4	C (M)KT RAD 1U5 63V	33120948
CK 5	C (M)KT RAD 100N 63V	33127106
CK 9	C CER1 SMD 56P 50V	32125526
CK 10, 28	C (M)KT RAD 220N 63V	33127108
CK 12	C ECAP RAD 100U 16V	34223252
CK 13	C CER1 SMD 330P 50V	32125517
CK 14	C ECAP RAD 47U 63V	34540053
CK 15	C ECAP BLK 2200U 25V	34510005
CK 16	C (M)KT RAD 22N 400V	33150965
CK 17△, 23△	C (M)KC BLK 330N 250V	33660001
CK 18	C (M)KP BLK 820P 1K5V	33450039
CK 19	C ECAP BLK 4U7 250V HV	34610001
CK 20	C (M)KT BLK 100N 250V	33360003
CK 21	C CER2/3 RAD 2N2 20% 500V	32780003
CK 22	C CER2/3 RAD 330P 10% 500V Y	32780002
CK 24	C (M)KP BLK 470P H 1K6V	33460011
CK 25	C (M)KP BLK 15N H 100V	33460003
CK 26△	C (M)KP BLK 10N 1K6V	33450037
CK 26-1△, 26-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
CK 27△	C (M)KP BLK 30N 3.5% 630V	33450064
CK 27-1△, 27-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
CK 29△	C (M)KP BLK 560N 250V	33460021
Ck 29-1△, 29-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
CK 30, 44	C (M)KT RAD 470N 63V	33127123
CK 30-1△, 30-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009

Item	Description	Order no.
CK 31-1△, 31-2△, 34-1△, 34-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
CK 32△, 33△	C (M)KP BLK 56N 400V	33450061
CK 34△	PROPKO 300n 5% 250V MKP10	22171302
CK 36-1△, 36-2△, 32-1△, 32-2△, 33-1△, 33-2△, 17-1△, 17-2△, 18-1△, 18-2△, 23-1△, 23-2△, 24-1△, 24-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
CO 1△, 4△	C CER2/3 BLK 1N0 20% 400VAC Y	32610922
CO 2△	C (M)KT BLK 220N 400V	33360002
CO 5, 10, 14, 48	C CER1 SMD 1N0 50V	32125545
CO 6	C CER1 SMD 56P 50V	32125526
CO 7-1△, 7-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
CO 8	C (M)KP RAD 1N0 H 100V	33622914
CO 9	C CER2 SMD 3N3 50V	32536207
CO 11	C CER1 SMD 330P 50V	32125517
CO 12, 50, 51, 52, 55, 56, 63, 65	C CER2 SMD 100N 25V	32190001
CO 13	C ECAP RAD 47U 63V	34540053
CO 19	C ECAP BLK 220U 450V HV	34540102
CO 20	C (M)KT RAD 1U0 63V	33124758
CO 21	C (M)KP BLK 220P 1K6V	33460009
CO 22	C (M)KT BLK 10N 630V	33380023
CO 23△	C CER2/3 BLK 1N5 20% 400VAC Y	32960002
CO 24	C CER2/3 RAD 330P 10% 500V Y	32780002
CO 25, 26	C CER2/3 RAD 1N0 10% 500V Y	32780004
CO 29, 54	C (M)KT BLK 100N 250V	33360003
CO 31	C ECAP BLK 2200U 35V	34226678
CO 32	C ECAP BLK 1000U 35V	34510010
CO 33, 39, 40, 41, 42	C (M)KT RAD 100N 63V	33127106
CO 36	C ECAP BLK 220U 250V HV	34610007
CO 43	C ECAP BLK 1000U 16V	34510004
CO 45	C ECAP RAD 10U 63V	34540025
CO 49	C CER2 SMD 10N 50V	32536213
CO 58, 59, 64	C ECAP RAD 100U 16V	34223252
CO 69	C (M)KP BLK 33N 1KV	33460016
CQ 2	C CER1 SMD 1N0 50V	32125545
CQ 4	C ECAP RAD 10U 63V	34540025
CQ 5, 6	C CER2 SMD 100N 25V	32190001
CQ 10	C ECAP RAD 100U 16V	34223252
CS 1	C (M)KT RAD 100N 63V	33127106
CS 3	C (M)KT BLK 47N 100V	33380019
CS 4	C (M)KP RAD 10N 250V	33450057
CS 5	C (M)KT RAD 470N 63V	33127123
CS 6	C CER2 SMD 100N 25V	32190001
CS 7	C ECAP RAD 47U 63V	34540053
CS 8, 10	C CER2 SMD 10N 50V	32536213
CS 11, 12	C CER2 SMD 4N7 50V	32536210

## TRANSISTORS



TA 5	TR NPN SMD BC847B 45V	36145312
TK 1, 2, 4, 9	TR PNP SMD BC857B 45V	36145412
TK 3	TR NPN PWR BLK 2SD2012 60V 3A	36270004
TK 3, 12	HEATSINK SPRING	79400021
TK 6, 25	TR NPN SMD BC847B 45V	36145312
TK 8	TR NPN RAD BC637 60V 1A	36220003
TK 10	N-FET PWR BLK BUK457-400B 400V 11A	36370003
TK 11	TR NPN RAD BF422 250V	36125217
TK 12	TR NPN PWR BLK BU2525AF 1K5V 12A	36270003

Item	Description	Order no.	Item	Description	Order no.
TO 1	N-FET BLK STP7NC70Z 700V 6.8A	36370018	FUSES		
TO 1	INSULATOR FOIL FOR 247 1k5V	49000088	FO 1△	FUSE F2.5A MINIATURE	43770004
TO 1	HEATSINK SPRING	79400021	FO 1-1△, 1-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
TO 1-2△, 1-3△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009	FO 2△, 7△, 8△	FUSE T2.0A MINIATURE	43770005
TQ 1	TR NPN SMD BC847B 45V	36145312			
TS 5, 6, 7, 8, 9, 10	TR PNP SMD BC857B 45V	36145412			
<b>DIODES</b> 			<b>TRANSFORMERS</b> 		
DK 2, 3, 5, 6	DI SMD LS4148 75V 200mA	36490002	TRK 1	TRAFO 545 01 204 00	45380013
DK 9, 12	DI RECT PWR AX BYV36C 600V 1.6A	36575452	TRK 2△	DST TRAFO 1372.9018	45360083
DK 11, 14	DI RECT PWR AX 1N4937 600V 1.0A	36575353	TRK 2-5△, 2-7△, 2-9△, 2-10△, 2-13△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
DK 13	DI AX RECT BYT56J 600V 1.5A	36240001	TRK 2-16△, 2-1△, 2-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
DK 15	DI RECT PWR AX BYV26C 600V 1.0A	36610005	TRK 3-1△, 3-3V, 3-4△, 3-6△, 5-1△, 5-3△, 5-4△, 5-6△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
DK 16	DI BK RECT BYM357X DAMPER+MODULATOR	36621564	TRO 2△	MAINS TRAFO 2322.0030	45320069
DK 16	HEATSINK SPRING	79400021	TRO 2-10△, 2-19△, 2-21△, 2-22△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
DK 16-1△, 16-2△, 16-3△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009			
DO 1, 3, 4, 6	DI RECT PWR AX BY527 1K25V 2A	36610001			
DO 2	DI AX RECT UF5408 1K0V 3.0A	36621568			
DO 7-1△, 7-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009			
DO 9, 21	DI SMD LS4148 75V 200mA	36490002	<b>COILS</b> 		
DO 14	DI SMD BAS20 150V 200mA	36560320	TRK 5△	COIL BLK RAD 68uH 15% E/W	45380024
DO 16-1△, 16-2△, 22-1△, 22-2△, 26-1△, 26-2△, 27-1△, 27-2△, 1-1△, 1-2△, 2-1△, 2-2△, 3-1△, 3-2△, 4-1△, 4-2△, 6-1△, 6-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009	LK 1	COIL LIN BLK EKM12-136	45161283
DO 17, 18	DI RECT AX BYW98 200V 3A	36575470	LK 1-1△, 1-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
DO 19	IC VREF TL431CLP	37410012	LK 1-3△, 1-4△, 2-1△, 2-2△, 5-1△, 5-2△, 6-1△, 6-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
DO 26	DI AX SCHK SB560 60V 5.0A	36420005	LK 2	COIL BLK 280uH FJ1311	45610004
DO 27	DI RECT PWR AX BA158 600V 0.5A	36561010	LK 3	COIL BLK 1.9mH 14R DRM0630192010K-01	45610018
DS 1	DI SMD LS4148 75V 200mA	36490002	LK 4	EMI SUPPRES BEAD 3.5x9	45620007
			LK 5, 6	COIL BLK 47uH 7% 1.7A RAD	45620035
			LO 3, 14, 15, 16	EMI SUPPRES BEAD 3.5x9	45620007
			LO 5, 7	COIL BLK 10uH 1200mA RAD	45571699
			LO 10	COIL AX 10uH 1200mA	45571698
			LO 13△	COIL BLK 43mH 1.2A 250V	45390025
			LO 13-2△, 13-3△, 13-7△, 13-10△, 13-12△, 14-1△, 14-2△, 15-1△, 15-2△, 17-1△, 17-3△, 17-4△, 17-6△, 17-7△, 17-12△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
			LQ 1	COIL BLK 10uH 1200mA RAD	45571699
<b>ZENERS</b> 			<b>OTHERS</b> 		
ZDK 4	Z DIODE SMD BZX84C 51V	36770035	HCK 17_1-1△, 23_1-1△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
ZDK 5, 11	Z DIODE SMD BZX84C 2V4	36780005	HCK 29-1△, 29_1-1△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
ZDK 10, 3	Z DIODE SMD BZX84B 12V	36780008	HCK 34-1△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
ZDO 1, 11	Z DIODE SMD BZX84B 12V	36780008			
ZDQ 1	Z DIODE SMD BZX84B 30V	36770033			
<b>INTEGRATED CIRCUITS</b> 					
ICA 2	IC AUDIO TDA2616 12+12W	37631259			
ICA 2	HEATSINK SPRING	79400021			
ICO 1	IC PWR CONT TDA16846	37450019			
ICO 3△	IC OPTO COUPL SFH615A-2	36950009			
ICO 5	IC V-REG PQ05RH11 5V 1.5A	37460008			
ICO 5, 8, 11	HEATSINK SPRING	79400021			
ICO 8	IC V-REG PQ3RD13 3V3 1.0A	37460033			
ICO 11	IC V-REG L7812CV 12V 1.5A	37681748			
ICS 1	IC DEFL TDA8354Q/N11/N1E S137450017	37450017			
ICS 1	HEATSINK SPRING	79400021			

Item	Description	Order no.
HXKT 1-1△, 2-1△, 3-1△, 4-1△, 7-1△, 8-1△, 9-1△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
J 4, 45, 54, 61, 89, 121, 131, 137, 138, 151, 166, 173, 185, 195, 193, 200, 211, 219, 300, 324, 327, 329, 331, 332	JUMPER R=15,0 mm	85700150
J 6, 8, 55, 73, 81, 92, 113, 114, 123, 139, 140, 169, 188, 191, 213, 216, 338	JUMPER R=17,5 mm	85700175
J 12, 19, 21, 22, 23, 25, 39, 40, 41, 42, 43, 44, 50, 57, 60, 71, 76, 83, 84, 96, 158, 161, 167, 180, 187, 204, 207, 218, 302, 306, 311, 312, 315, 317, 318, 339	JUMPER R=12,5 mm	85700125
J 15, 49, 51, 53, 67, 68, 74, 75, 77, 98, 124, 134, 148, 164, 178, 181, 186, 199, 201, 217, 304, 330, 342	JUMPER R=20,0 mm	85700200
J 33, 301, 335, 340, 341, 344	R SMD 0R 0W10	31425802
J 93, 100, 103, 108, 142, 146, 147, 163, 179, 194, 206, 208, 210, 212, 215, 303, 305, 308	JUMPER R=10,0 mm	85700100
J 145	JUMPER R=11,25 mm	85701125
J 194-1△, 194-2△, 195-1△, 195-2△, 200-1△, 200-2△, 202-1△, 202-2△, 315-1△, 315-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
J 307, 314, 328	JUMPER R= 7,5 mm	85700075
JK 1	JUMPER R=12,5 mm	85700125
JQ 10	R SMD 0R 0W10	31425802
TU 1	TUNER FQ1216ME/I V-3	58231067
XA 2	ROW CONN 4-PIN VERT	73190604
XAV 1	CONN ROW 9-PIN VERT	41710068
XAV 2, 3	CONN ROW 19-PIN VERT	41710073
XK 3	ROW CONN 5-PIN VERT	41710001
XK 3-1△, 3-2△, 3-3△, 3-4△, 3-5△, 7-1△, 7-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
XK 6	CONN HEADER 6-PIN PITCH	41710002
XKT 1	BLADE CONN 2.8MM FOR PCB MALE	41930001
XO 1	ROW CONN 2-PIN VERT LOCK	73184750
XO 1-1△, 1-2△	CONN GRIPLET FOR 2-SIDED PCB d=1.9mm	41930009
XO 3	CONN ROW 2-PIN VERT	41710212
XS 1	ROW CONN 3-PIN VERT	73190603
XT 1, 2	CONN ROW 7-PIN VERT INS SLEEVE FOR CONN BLADE 2.8mm ANTENNA CABLE ASSY 200mm RCA/IEC	41710077 47310004 47780009

Item	Description	Order no.
	HOLDER CLIP FOCUS 3mm	54041366
	HOLDER CLIP ANODE 4mm	54041417
	CONNECTING PLATE	84488470
△	CABLE ANODE FOR DST 570mm+CHIMNEY CAP	96008868
△	FOCUS CABLE 1,2 410MM	96010230
△	SCREEN CABLE 460mm	96010244
△	ELDOR-DST CABLE 280MM	96011091

### AV163 Signal module\*

#### RESISTORS



R 1, 2, 4, 5, 133	R SMD 270R 0W10	31425855
R 3, 63, 195	R SMD 1K0 0W10	31425820
R 6, 7, 80, 98, 148, 149, 161, 162, 170, 171, 291, 294, 312, 324, 332, 339	R SMD 100R 0W10	31490626
R 8, 9, 97, 230	R SMD 47K 0W10	31425836
R 10, 157, 184, 222, 224	R SMD 22K 0W10	31490656
R 12, 13, 52, 85, 87, 104, 105, 142, 178, 181, 220, 272, 273, 278	R SMD 10K 0W10	31425833
R 14	R SMD 22R J 0W10	31490617
R 15, 16, 19, 20, 25, 26, 27	R SMD 100K 0W10	31490664
R 17, 18, 29, 30, 35, 36, 37, 144, 200, 302	R SMD 470R 0W10	31490634
R 21, 22, 23, 24, 28, 65, 66, 67, 68, 69, 70, 221	R SMD 100K 0W10	31425844
R 31, 32, 33, 34, 38, 90, 91, 264, 348, 349, 354, 355	R SMD 470R 0W10	31425817
R 39	R SMD 8K2 0W10	31425832
R 40, 41, 42, 43, 64, 158, 167, 173, 194, 197, 254, 307	R SMD 220R 0W10	31490630
R 44, 45, 46, 47, 51, 54, 79, 92, 93, 94, 101, 102, 141, 217, 228, 229, 244, 245, 246, 247, 296	R SMD 100R 0W10	31425852
R 48, 49, 50, 53	R SMD 220K 0W10	31490668
R 55, 56, 58, 59, 60, 61, 62	R SMD 1M0 0W10	31490676
R 57	R SMD 1M0 0W10	31425801
R 72, 301, 310	R SMD 0R 0W10	31425802
R 78, 83, 84	R SMD 3K3 0W10	31490646
R 86, 169, 188, 261, 262	R SMD 2K2 0W10	31425828
R 88, 89, 269, 271	R SMD 33K 0W10	31490658
R 95, 96, 103, 106, 109, 123	R SMD 33K 0W10	31425840
R 99	R SMD 1K8 0W10	31490642
R 107, 112	R SMD 68K 0W10	31425838
R 108, 111	R SMD 47R 0W10	31425809
R 110	R CARF RAD 68R 5% 0W25	31630042
R 113	R SMD 3K9 0W10	31490647
R 130	R NTC SMD 33k	31910002
R 134, 175, 180, 187, 213, 279, 281, 283, 285	R SMD 75R 0W10	31490624
R 135, 306	R SMD 270R 0W10	31490631
R 136, 270	R SMD 18K 0W10	31490655
R 137	R CARF RAD 10K 5% 0W25	31630031

Item	Description	Order no.
R 138, 303, 304	R SMD 4K7 0W10	31490648
R 140, 150, 153, 243, 256, 290	R SMD 1K0 0W10	31490639
R 143, 159, 189, 292, 315, 322, 330, 337	R SMD 2K2 0W10	31490644
R 145, 152, 218, 219, 226, 259, 275, 277, 293, 295, 351, 352	R SMD 0R - JUMP	31490600
R 146	R SMD 68K 0W10	31490662
R 147	R SMD 6K8 0W10	31490650
R 151, 166	R SMD 27K 0W10	31490657
R 154, 155	R SMD 3K3 0W10	31425829
R 156, 163, 164, 165, 183, 190, 199, 204, 252, 253, 340, 341, 342	R SMD 10K 0W10	31490652
R 160, 231	R SMD 22K 0W10	31425837
R 174, 176, 177, 179, 182, 186, 206, 223, 232, 233, 234	R SMD 75R 0W10	31425861
R 196, 203, 205	R SMD 56K 0W10	31490661
R 198, 201, 202, 237, 360	R SMD 220R 0W10	31425815
R 214, 255, 266	R SMD 330R 0W10	31490632
R 227	R SMD 560R 0W10	31425818
R 235	R SMD 4K7 0W10	31425824
R 263	R SMD 430R 0W10	31425879
R 265	R SMD 910R 0W10	31425883
R 267	R SMD 390R 0W10	31425816
R 268	R SMD 300R 0W10	31425856
R 274	R SMD 82R 0W10	31425882
R 276	R SMD 330R 0W10	31425857
R 305	R SMD 27R 0W10	31490618
R 311, 325, 331, 338	R SMD 390R 0W10	31490633
R 313, 323, 329, 336	R SMD 22R 0W10	31490617
R 314	R SMD 33R 0W10	31490619
R 320, 321, 326, 328, 333, 335	R SMD 39R 0W10	31490620
R 343	EMI FERRITE BEAD	
	SMD 470R/100MHz 150mA	46900003
R 345, 346, 347	EMI FERRITE BEAD	
	SMD 600R/100MHz 200mA	46900004

## CAPACITORS



C 1, 2, 5, 11, 20, 22, 25, 29, 31, 34, 35, 49, 50, 70, 90, 96, 104, 154, 182, 184, 185, 188, 191, 192, 193, 194, 195, 196, 199, 204, 206, 209, 221, 275, 280, 294, 309, 312, 316, 320, 329, 335, 336, 337, 345, 351	C CER2 SMD 100N 16V	32200117
C 3, 8, 12, 13, 210	C CER1 SMD 220P 50V	32200062
C 4, 43, 83, 84, 129, 303, 304, 305	C CER2 SMD 10N 50V	32200102
C 6, 7, 147, 187, 190	C CER2 SMD 1U0 10V	32525907
C 9, 21, 23, 24, 26, 27, 28, 32, 36, 37, 38, 39, 48, 82, 167, 173, 176, 200, 223, 273, 313, 318	C CER2 SMD 100N 25V	32190001
C 10, 201, 202	C CER1 SMD 22P 50V	32200038
C 17, 19	C CER2 SMD 47N 50V	32536222
C 30, 33	C CER1 SMD 33P 50V	32125507

Item	Description	Order no.
C 40, 45, 46, 52, 91, 92, 93, 94, 105, 108, 117, 338, 339, 340	C CER2 SMD 47N 16V	32200113
C 41, 71, 72, 73, 74, 75, 76, 89, 97, 101, 102, 106, 107, 135, 136	C CER2 SMD 330N 16V	32525901
C 47, 69, 85, 86, 301	C CER2 SMD 1N0 50V	32536203
C 51, 56, 57, 66, 67, 68, 87, 88, 146, 149, 150, 151, 152, 291, 296, 297, 308	C CER2 SMD 1N0 50V	32790023
C 53, 54, 55, 62, 63, 64, 65, 156, 238, 242, 243, 244	C CER1 SMD 390P 50V	32145428
C 58, 59, 77, 78, 79, 80	C ECAP RAD 22U 35V	34540021
C 60, 61, 261	C CER2 SMD 390P 50V	32200068
C 81, 109, 127, 348, 352	C ECAP RAD 100U 25V	34540020
C 95	C ECAP RAD 3U3 63V	34540029
C 98, 99, 100, 175, 177, 180, 197, 198, 207, 208, 268, 288, 311, 317, 325, 326, 333	C ECAP RAD 10U 63V	34540025
C 103, 272	C CER1 SMD 47P 50V	32125508
C 118, 144, 145, 250, 253, 264, 282, 289, 290, 334, 342, 346, 347, 349	C CER2 SMD 10N 50V	32536213
C 125	C CER1 SMD 150P 50V	32125511
C 159, 160, 298, 302	C ECAP RAD 1U0 100V HV	34229675
C 174, 183, 220, 224, 281, 307, 314, 315, 319	C ECAP RAD 47U 50V	34540028
C 252	C CER1 SMD 10P 50V	32200030
C 270	C CER1 SMD 82P 50V	32125531
C 276, 277, 295	C CER1 SMD 47P 50V	32200046
C 278, 279	C CER1 SMD 3P3 50V	32200018
C 292, 330, 332, 355	C CER1 SMD 100P 50V	32200054
C 293	C CER2 SMD 470N 16V	32525903
C 299, 300	C CER1 SMD 27P 50V	32200040
C 310	C ECAP RAD 4U7 63V	34229578
C 331	C CER1 SMD 100P 50V	32125515
C 350	C CER1 SMD 68P 50V	32125516
C 353, 354	C CER2 SMD 4N7 50V	32536210

## TRANSISTORS




T 1, 2, 6, 44, 54, 57, 60, 62, 65	TR PNP SMD BC857B 45V	36145412
T 3, 4, 5, 7, 8, 11, 13, 20, 22, 23, 24, 25, 26, 27, 50, 51, 55, 56, 58, 59, 61, 63, 64, 66	TR NPN SMD BC847B 45V	36145312
T 12	TR PNP RAD BC557B 45V	36146424
T 52, 53	N-FET SMD 2N7002 60V 180mA	36380002


## DIODES




D 1	DIODE SMD BAV70 70V 215mA	36581954
D 18, 19, 20, 22	DIODE SMD BAS16 75V 250mA	36580318




Item	Description	Order no.
<b>ZENERS</b> 		
D 2	Z DIODE SMD BZX84C 8V2	36780003
D 21	Z DIODE SMD BZX84B 5V6	36780021

<b>INTEGRATED CIRCUITS</b> 		
IC 1	IC LOGIC SMD 74HC4053	37810038
IC 2	IC VIDEO SMD VSP9407B-QA-B11 P-MQFP80	37850243
IC 3	IC PWR MON. ZSM330 8	37410036
IC 4	IC VIDEO SMD TDA8601	37440045
IC 5	IC uC+text SDA6000-QH-B12 P-MQFP-128	37850226
IC 6	IC V-REG SMD L4931 2V5 0.3A	37460046
IC 7	IC OPAMP SMD MC33078D8	37470007
IC 10	IC EEPROM SMD 128x8 24LCS21A 8	37866003
IC 12	IC AUDIO MSP3411G-QA-B8-V3	37430039
IC 13	IC OPAMP SMD TL082CD 8	37470003
IC 14	<b>IC FLASH 1Mx16 CURRENT SOFTWARE VERSION 01.11.2002</b>	<b>MC2B01.0</b>
IC 14	IC FLASH 1Mx16 M29W160DB90N1 (BLANCO)	37860045
IC 16	IC SDRAM 4Bx1Mx16 K4S641632F-TC70000	37860044
IC 17	IC VIDEO SMD DDP3315C-QA-D2 P-MQFP80	37850236
IC 18	IC LOGIC SMD 4052BT	37810014
IC 19	IC EEPROM 4kx8 AT24C32 3-5V8	37866017
IC 22	IC V-REG SMD LM1117 1V8 0,8A	37460044

<b>COILS</b> 		
L 15, 16, 28, 29, 34, 35, 36	COIL SMD 10uH 1,6A	45640036
LAV 1, 2, 3, 4	COIL SMD 2,2uH 30mA	45640023
LAV 6, 23, 26, 28	COIL SMD 10uH 1,6A	45640036
LAV 13, 14, 15, 27	COIL SMD 10uH 15mA	45640026


<b>FILTERS</b> 		
L 3, 26, 27	EMIFIL RAD 4N7 1,0A	45558419
LAV 25	EMIFIL RAD 4N7 1,0A	45558419

<b>CRYSTALS</b> 		
Z 1	CRYSTAL SMD 20.250 MHz	45730022
Z 7	CRYSTAL SMD 6.000 MHz	45730024
Z 8	CRYSTAL SMD 18.432 MHz	45730021
Z 8	CRYSTAL SMD 5.000 MHz	45730023

<b>OTHERS</b> 		
JAV 2, 3, 4, 5, 14	R SMD 0R	31490600
JAV 9, 24	R SMD 0R 0W10	31425802
L 30, 31, 32, 33	R SMD 0R 0W10	31425802
XAF 1	CONN HEADER 20-PIN PITCH	41710071
XAH 1	CONN HEADER 10-PIN PITCH	41710070
XAV 1	MODULE CONN 9-PIN 90-DEG	41720002
XAV 2, 3	CONN MODULE 19-PIN	41720048

Item	Description	Order no.
XAV 4	SCART CONNECTOR BLACK	41911005
XAV 5	SCART CONNECTOR BLUE	41911006
XAV 6	SCART CONNECTOR ORANGE	41911007
XAV 7	CONN RCA VERT	41910013
XAV 8	CONN D-TYPE 15-PIN VGA HD FEMALE	41720051

## AV165 Signal module\*

<b>RESISTORS</b> 		
R 1, 2, 4, 5, 133	R SMD 270R 0W10	31425855
R 3, 63, 195	R SMD 1K0 0W10	31425820
R 6, 7, 80, 98, 148, 149, 161, 162, 170, 171, 291, 294, 312, 324, 332, 339	R SMD 100R 0W10	31490626
R 8, 9	R SMD 47K 0W10	31425836
R 10, 157, 184, 222, 224	R SMD 22K 0W10	31490656
R 12, 13, 85, 104, 105, 142, 178, 272, 273, 278	R SMD 10K 0W10	31425833
R 14	R SMD 22R J 0W10	31490617
R 19, 20, 25, 26, 27, 344	R SMD 100K 0W10	31490664
R 21, 22, 28	R SMD 100K 0W10	31425844
R 29, 30, 35, 36, 37, 144, 200, 302	R SMD 470R 0W10	31490634
R 31, 32, 38, 264, 348, 349, 354, 355	R SMD 470R 0W10	31425817
R 39	R SMD 8K2 0W10	31425832
R 44, 45, 46, 47, 79, 92, 93, 94, 101, 102, 141, 217, 244, 245, 246, 247, 296	R SMD 100R 0W10	31425852
R 52, 72, 301	R SMD 0R 0W10	31425802
R 55, 56, 58, 59, 60, 61, 62	R SMD 1M0 0W10	31490676
R 57	R SMD 1M0 0W10	31425801
R 64, 158, 167, 173, 194, 197, 254, 307	R SMD 220R 0W10	31490630
R 78, 83, 84	R SMD 3K3 0W10	31490646
R 99	R SMD 1K8 0W10	31490642
R 106, 109	R SMD 33K 0W10	31425840
R 107, 112	R SMD 68K 0W10	31425838
R 108, 111	R SMD 47R 0W10	31425809
R 110	R CARF RAD 180R 5% 0W25	31630026
R 113	R SMD 3K9 0W10	31490647
R 130	R NTC SMD 33k	31910002
R 134, 175, 187, 213, 285	R SMD 75R 0W10	31490624
R 135, 306	R SMD 270R 0W10	31490631
R 136, 270	R SMD 18K 0W10	31490655
R 137	R CARF RAD 10K 5% 0W25	31630031
R 138, 303, 304	R SMD 4K7 0W10	31490648
R 140, 153, 243, 256, 290	R SMD 1K0 0W10	31490639
R 143, 159, 189, 292, 315, 322, 330, 337	R SMD 2K2 0W10	31490644
R 146	R SMD 68K 0W10	31490662
R 147	R SMD 6K8 0W10	31490650
R 151, 166	R SMD 27K 0W10	31490657
R 154, 155	R SMD 3K3 0W10	31425829
R 156, 163, 164, 165, 183, 190, 199, 204, 252, 253, 340, 341, 342	R SMD 10K 0W10	31490652
R 160, 222, 231	R SMD 22K 0W10	31425837
R 169, 188, 261, 262	R SMD 2K2 0W10	31425828

Item	Description	Order no.
R 174, 176, 177, 186, 206, 223	R SMD 75R 0W10	31425861
R 196, 203, 205	R SMD 56K 0W10	31490661
R 198, 201, 202, 237, 360	R SMD 220R 0W10	31425815
R 214, 255, 266	R SMD 330R 0W10	31490632
R 218, 219, 226, 293, 295, 309, 351, 352	R SMD 0R - JUMP	31490600
R 227	R SMD 560R 0W10	31425818
R 235	R SMD 4K7 0W10	31425824
R 263	R SMD 430R 0W10	31425879
R 265	R SMD 910R 0W10	31425883
R 267	R SMD 390R 0W10	31425816
R 268	R SMD 300R 0W10	31425856
R 269, 271	R SMD 33K 0W10	31490658
R 274	R SMD 82R 0W10	31425882
R 276	R SMD 330R 0W10	31425857
R 305	R SMD 27R 0W10	31490618
R 311, 331, 325, 338	R SMD 390R 0W10	31490633
R 313, 323, 329, 336	R SMD 22R 0W10	31490617
R 314	R SMD 33R 0W10	31490619
R 320, 321, 326, 328, 333, 335	R SMD 39R 0W10	31490620
R 343	EMI FERRITE BEAD SMD 470R/100MHz 150mA	46900003
R 345, 346, 347	EMI FERRITE BEAD SMD 600R/100MHz 200mA	46900004

## CAPACITORS



C 1, 2, 5, 11, 20, 22, 25, 29, 31, 34, 35, 49, 50, 90, 96, 154, 182, 184, 185, 188, 191, 192, 193, 194, 195, 196, 199, 204, 206, 209, 275, 280, 294, 309, 312, 316, 320, 329, 335, 336, 337, 345, 351	C CER2 SMD 100N 16V	32200117
C 3, 8, 12, 13, 210	C CER1 SMD 220P 50V	32200062
C 4, 43, 129, 303, 304, 305	C CER2 SMD 10N 50V 0603	32200102
C 6, 7, 147, 187, 190	C CER2 SMD 1U0 10V	32525907
C 9, 21, 23, 24, 26, 27, 28, 32, 36, 37, 38, 39, 48, 82, 167, 176, 200, 273, 313, 318	C CER2 SMD 100N 25V	32190001
C 10, 201, 202	C CER1 SMD 22P 50V	32200038
C 17, 19	C CER2 SMD 47N 50V	32536222
C 30, 33	C CER1 SMD 33P 50V	32125507
C 41, 71, 72, 73, 74, 101, 102	C CER2 SMD 330N 16V	32525901
C 45, 92, 93, 94, 338, 339, 340	C CER2 SMD 47N 16V 0603	32200113
C 47, 69, 85, 86, 301	C CER2 SMD 1N0 50V	32536203
C 51, 66, 67, 68, 87, 88, 146, 149, 150, 151, 152, 291, 296, 297, 308	C CER2 SMD 1N0 50V 0603	32790023
C 54, 55, 62, 63, 156, 238, 242, 243, 244	C CER1 SMD 390P 50V	32145428
C 60, 61	C CER2 SMD 390P 50V	32200068
C 77, 78, 79, 80	C ECAP RAD 22U 35V	34540021
C 81, 109, 127, 348, 352	C ECAP RAD 100U 25V	34540020
C 95	C ECAP RAD 3U3 63V	34540029

Item	Description	Order no.
C 98, 99, 100, 175, 177, 180, 197, 198, 207, 208, 268, 288, 311, 317, 325, 326, 333	C ECAP RAD 10U 63V	34540025
C 103, 272	C CER1 SMD 47P 50V	32125508
C 118, 282, 289, 290, 334, 342, 346, 347, 349	C CER2 SMD 10N 50V	32536213
C 125	C CER1 SMD 150P 50V	32125511
C 159, 160, 298, 302	C ECAP RAD 1U0 100V HV	34229675
C 174, 183, 281, 307, 314, 315, 319	C ECAP RAD 47U 50V	34540028
C 252	C CER1 SMD 10P 50V	32200030
C 270	C CER1 SMD 82P 50V	32125531
C 276, 277, 295	C CER1 SMD 47P 50V	32200046
C 278, 279	C CER1 SMD 3P3 50V	32200018
C 292, 330, 332, 355	C CER1 SMD 100P 50V	32200054
C 293	C CER2 SMD 470N 16V	32525903
C 299, 300	C CER1 SMD 27P 50V	32200040
C 310	C ECAP RAD 4U7 63V	34229578
C 331	C CER1 SMD 100P 50V	32125515
C 350	C CER1 SMD 68P 50V	32125516
C 353, 354	C CER2 SMD 4N7 50V	32536210

## TRANSISTORS



T 1, 2, 6, 44, 54, 57, 60, 62, 65	TR PNP SMD BC857B 45V	36145412
T 3, 5, 7, 8, 11, 13, 20, 22, 23, 24, 25, 26, 27, 50, 51, 55, 56, 58, 59, 61, 63, 64, 66	TR NPN SMD BC847B 45V	36145312
T 12	TR PNP RAD BC557B 45V	36146424
T 52, 53	N-FET SMD 2N7002 60V 180mA	36380002

## DIODES



D 1	DIODE SMD BAV70 70V 215mA	36561954
D 18, 19, 20, 22	DIODE SMD BAS16 75V 250mA	36560318

## ZENERS



D 2	Z DIODE SMD BZX84C 8V2	36780003
D 21	Z DIODE SMD BZX84B 5V6	36780021

## INTEGRATED CIRCUITS



IC 1	IC LOGIC SMD 74HC4053	37810038
IC 2	IC VIDEO SMD VSP9407B-QA-B11 P-MQFP80	37850243
IC 3	IC PWR MON. ZSM330 8	37410036
IC 5	IC uC+TEXT SDA6000-QH-B12 P-MQFP-128	37850226
IC 6	IC V-REG SMD L4931 2V5 0,3A	37460046
IC 7	IC OPAMP SMD MC33078D8	37470007
IC 12	IC AUDIO MSP3411G-QA-B8-V3	37430039
IC 14	IC FLASH 1Mx16 CURRENT SOFTWARE VERSION 01.11.2002	MC2B01.0

Item	Description	Order no.
IC 14	IC FLASH 1Mx16 M29W160DB90N1 (BLANCO)	37860045
IC 16	IC SDRAM 4Bx1Mx16 K4S641632F-TC70000	37860044
IC 17	IC VIDEO SMD DDP3315C-QA-D2 P-MQFP80	37850236
IC 19	IC EEPROM 4Kx8 AT24C32 3-5V8	37866017
IC 22	IC V-REG SMD LM1117 1V8 0,8A	37460044

## COILS



L 15, 16, 28, 29, 34, 35, 36	COIL SMD 10uH 1,6A	45640036
LAV 1, 2, 4	COIL SMD 2,2uH 30mA	45640023
LAV 6, 23, 26, 28	COIL SMD 10uH 1,6A	45640036
LAV 15, 27	COIL SMD 10uH 15mA	45640026

## FILTERS



L 3, 26, 27	EMIFIL RAD 4N7 1,0A	45558419
LAV 25	EMIFIL RAD 4N7 1,0A	45558419

## CRYSTALS



Z 1	CRYSTAL SMD 20,250 MHz	45730022
Z 7	CRYSTAL SMD 6,000 MHz	45730024
Z 8	CRYSTAL SMD 18,432 MHz	45730021
Z 9	CRYSTAL SMD 5,000 MHz	45730023

## OTHERS



JAV 2, 3, 4, 5, 14, 19, 21, 22, 23	R SMD 0R	31490600
JAV 7, 8, 9, 24	R SMD 0R 0W10	31425802
XAF 1	CONN HEADER 20-PIN PITCH	41710071
XAH 1	CONN HEADER 10-PIN PITCH	41710070
XAV 1	MODULE CONN 9-PIN 90-DEG	41720002
XAV 2, 3	CONN MODULE 19-PIN	41720048
XAV 4	SCART CONNECTOR BLACK	41911005
XAV 5	SCART CONNECTOR BLUE	41911006
XAV 7	A/V MODULE BRACKET	84481920

## HH201 CRT module\*

## RESISTORS



RH 1	R SMD 3K0 0W10	31490062
RH 2	R SMD 1K00 0W10	31490056
RH 26	R CARF RAD 33K 5% 0W25	31630036
RH 3, 12, 16, 60	R SMD 0R 0W10	31425802
RH 6, 7, 8, 9, 11, 14	R SMD 1K5 0W10	31425826
RH 4, 13, 17	R METF AX 68K 2% 1W0	31440008
RH 18, 19, 21, 22, 23, 24	R COMP AX 470R 0W25	31595565
RH 27	R CARF AX 4M7 5% 0W25	31660029
RH 28, 33	R COMP AX 1K5 0W50	31594639
RH 31	R SMD 68R 0W10	31425876
RH 36	R SMD 100K 0W10	31425844
RH 37, 52	R SMD 2K2 0W10	31425828
RH 38	R SMD 470R 0W10	31425817
RH 39, 59	R SMD 1K0 0W10	31425820
RH 40	R SMD 100R 0W10	31425852
RH 41, 53	R SMD 6K8 0W10	31425831
RH 42, 54	R CARF RAD 330R 5% 0W25	31514524

Item	Description	Order no.
RH 43, 56	R CARF RAD 3R3 5% 0W25	31514515
RH 44, 48	R FUS V RD 330R 0W25	31860005
RH 46, 48	R CARF RAD 10R 5% 0W25	31514513
RH 47, 49	R SMD 18K 0W10	31425813
RH 50	R SMD 560R 0W10	31425818
RH 51	R CARF RAD 220R 0W25	31630051
RH 58	R SMD 330R 0W10	31425857
RH 61, 62, 63	R SMD 220R 0W10	31425815
RH 64	R CARF AX 270R 5% 0W25	31660011

## CAPACITORS



CH 1	C ECAP RAD 47U 16V	34223251
CH 2, 7, 12, 36, 38	C CER2 SMD 22N 50V	32536221
CH 3, 8, 13, 32, 33, 34, 37, 39	C CER2 SMD 100N 50V	32536223
CH 4, 9, 14, 19	C (M)KT RAD 22N 250V	33380002
CH 5	C CER1 SMD 68P 50V	32125516
CH 6, 11, 16	C CER2 SMD 1N0 50V	32536203
CH 17	C ECAP BLK 4U7 250V HV	34610001
CH 18	C ECAP BLK 10U 250V HV	34610002
CH 22	C (M)KT BLK 8N2 1K5V	33360007
CH 27, 29, 43	C ECAP RAD 10U 63V	34540025
CH 28	C ECAP RAD 100U 25V	34540020
CH 31	C ECAP RAD 47U 63V	34540053
CH 41	C CER1 SMD 680P 50V	32190014
CH 42	C CER1 SMD 47P 50V	32125508
CH 44	C CER2 SMD 10N 50V	32536213
CH 46	C CER2 SMD 4N7 50V	32536210

## TRANSISTORS



TH 1	TR NPN RAD BF422 250V	36125217
TH 2, 6	TR PNP SMD BC857B 45V	36145412
TH 3	TR NPN SMD BC847B 45V	36145312
TH 4	TR PNP BLK 2SA1837 230V 1A	36270021
TH 7	TR NPN BLK 2SC4793 230V 1A	36270020

## DIODES



DH 1, 2	DI RECT PWR AX BYV36C 600V 1.6A	36575452
DH 3, 4, 5	DIODE SMD BAS16 75V 250mA	36560318
DH 6, 7, 8, 9, 10, 11	DI SMD BAV103 200V 250mA	36561950
DH 12, 13	DI SMD LS4148 75V 200mA	36490002

## INTEGRATED CIRCUITS



ICH 1, 2, 3	IC VIDEO TDA6111Q-N4C	37440004
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## COILS



LH 1	COIL AX 10UH 10% 230mA	45620003
LH 6, 7	COIL AX 10uH 1200mA	45571698

## OTHERS



CRT 1, 2	BLADE CONN 2.8MM	41930001
J 4, 18, 24, 29, 30, 31	JUMPER R=10,0 mm	85600061
J 17	JUMPER R=12,5 mm	85600078
J 20	JUMPER R=15,0 mm	85600085
J 21, 25, 27, 28, 32	JUMPER R=7,5 mm	85600054
J 22	R SMD 0R 0W10	31425802

Item	Description	Order no.
S 1△	SPARK GAP 2,0kV +/-500V	41555001
SOH 2△	CRT SOCKET 0330 7700 44	41510006
UG 2	BLADE CONN 2.8MM	41930001
XH 1	WIRE BUNDLE 6-PIN 370mm	96010019
XH 2	RGB CABLE 10-PIN	96010198
XH 3	H-DY SVM CABLE.	96010204
	PT-SCREW 3,5x6,5 POZ	62038859

### HH203 CRT module\*

#### RESISTORS



RH 1	R SMD 3K0 0W10	31490062
RH 2	R SMD 1K00 0W10	31490056
RH 3, 12, 16	R SMD 0R 0W10	31425802
RH 4, 13, 17	R METF AX 68K 2% 1W0	31440008
RH 6, 7, 8, 9, 11, 14	R SMD 1K5 0W10	31425826
RH 18, 19, 21, 22, 23, 24	R COMP AX 470R 0W25	31595565
RH 26	R CARF RAD 33K 5% 0W25	31630036
RH 27	R CARF AX 4M7 5% 0W25	31660029
RH 28, 33	R COMP AX 1K5 0W50	31594639
RH 31	R SMD 68R 0W10	31425876
RH 36	R SMD 100K 0W10	31425844
RH 37	R SMD 2K2 0W10	31425828
RH 38	R SMD 470R 0W10	31425817
RH 39, 59	R SMD 1K0 0W10	31425820
RH 40	R SMD 100R 0W10	31425852
RH 64	R CARF AX 270R 5% 0W25	31660011
RH 61, 62, 63	R SMD 220R 0W10	31425815

#### CAPACITORS



CH 1	C ECAP RAD 47U 16V	34223251
CH 2, 7, 12	C CER2 SMD 22N 50V	32536221
CH 3, 8, 13	C CER2 SMD 100N 50V	32536223
CH 4, 9, 14, 19	C (M)KT RAD 22N 250V	33380002
CH 5	C CER1 SMD 68P 50V	32125516
CH 6, 11, 16	C CER2 SMD 1N0 50V	32536203
CH 17	C ECAP BLK 4U7 250V HV	34610001
CH 18	C ECAP BLK 10U 250V HV	34610002
CH 22	C (M)KT BLK 8N2 1K5V	33360007
CH 27, 43	C ECAP RAD 10U 63V	34540025
CH 28	C ECAP RAD 100U 25V	34540020
CH 46	C CER2 SMD 4N7 50V	32536210

#### TRANSISTORS



TH 1	TR NPN RAD BF422 250V	36125217
TH 2	TR PNP SMD BC857B 45V	36145412

#### DIODES



DH 1, 2	DI RECT PWR AX BYV36C 600V 1.6A	36575452
DH 3, 4, 5	DIODE SMD BAS16 75V 250mA	36560318
DH 6, 7, 8, 9, 10, 11	DI SMD BAV103 200V 250mA	36561950

#### ZENERS



ZDH 1	Z DIODE SMD BZX84B 24V 2% 36780022	
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Item	Description	Order no.
<b>INTEGRATED CIRCUITS</b>		
ICH 1, 2, 3	IC VIDEO TDA6111Q-N4C	37440004

#### COILS



LH 1	COIL AX 10UH 10% 230mA	45620003
LH 6	COIL AX 10uH 1200mA	45571698

#### OTHERS



CRT 1, 2	BLADE CONN 2.8MM	41930001
J 4, 18, 24, 29, 30, 31	JUMPER R=10,0 mm	85600061
J 17	JUMPER R=12,5 mm	85600078
J 20	JUMPER R=15,0 mm	85600085
J 21, 25, 27, 28, 32	JUMPER R=7,5 mm	85600054
J 22	R SMD 0R 0W10	31425802
S 1△	SPARK GAP 2,0kV +/-500V	41555001
SOH 1△	CRT SOCKET 0330 5500 34	41554034
UG 2	BLADE CONN 2.8MM	41930001
XH 1	WIRE BUNDLE 6-PIN 370mm	96010019
XH 2	RGB CABLE 10-PIN	96010198
	PT-SCREW 3,5x6,5 POZ	62038859

### FC110 Control unit module

#### RESISTORS



RFC 1, 2, 31	R SMD 47K 0W10	31425836
RFC 3, 4	R SMD 75R 0W10	31425861
RFC 5	R SMD 470R 0W10	31425817
RFC 7, 16	R SMD 22K 0W10	31425837
RFC 9, 14, 37	R SMD 1K0 0W10	31425820
RFC 10, 55	R SMD 4K7 0W10	31425824
RFC 13	R SMD 100R 0W10	31425852
RFC 17	R SMD 100K 0W10	31425844
RFC 19, 20	R SMD 10K 0W10	31425833
RFC 21, 22	R CARF AX 2K2 5% 0W25	31660037
RFC 26	R CARF AX 100R 0W25	31660049
RFC 27	R FUS V RD 150R 0W25	31860004
RFC 41	R SMD 220R 0W10	31425815
RFC 43, 44, 45, 48, 49	R SMD 1M0 0W10	31425801
RFC 47	R SMD 270R 0W10	31425855
RFC 52	R FUS V AX 4K7 0W50	31850009
RFC 56	R FUS V RD 47R 0W25	31860006
RFC 57	R SMD 2K20 0W10	31490098
RFC 58	R SMD 6K81 0W10	31490455

#### CAPACITORS



CFC 1_1-1△, 1-2△, 2-1△, 2-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
CFC 1△, 2△	C MP/P BLK 100N 275VAC X2	33260003
CFC 3	C ECAP RAD 470U 10V	34221242
CFC 4	C ECAP BLK 1000U 16V	34550001
CFC 5, 7	C CER2 SMD 4N7 50V	32536210
CFC 6, 10	C CER1 SMD 220P 50V	32125513
CFC 8, 20	C ECAP RAD 10U 35V	34540027
CFC 11	R SMD 0R 0W10	31425802
CFC 12, 13	C CER1 SMD 390P 50V	32145428
CFC 14, 15	C ECAP RAD 100U 25V	34540020
CFC 16, 17	C CER2 SMD 22N 50V	32536221
CFC 18, 19	C CER2 SMD 47N 50V	32536222
CFC 21, 22	C CER1 RAD 15P 100V	32180003

Item	Description	Order no.
CFC 27	C ECAP RAD 2U2 400V	34540097
CFC 32	C CER2 SMD 10N 50V	32536213
CFC 35, 38, 39	C CER2 SMD 100N 25V	32190001
CFC 36	C CER2 RAD 47P 1K0V	32790054
CFC 42	C CER2 RAD 1N5 S 2K0V	32670976
CFC 43	C CER1 SMD 82P 50V	32125531
CFC 44	C CER1 SMD 270P 50V	32125529
CFC 45	C CER1 SMD 470P 50V	32145430

## TRANSISTORS



TFC 5, 6, 7, 8	TR NPN SMD BC847B 45V	36145312
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## DIODES



DFC 1	DI RECT PWR AX BYV36C 600V 1,6A	36575452
DFC 4	LED RAD LS5460HL RED 5mm	36910004
DFC 9	JUMPER R=12,5 mm	85600078
DFC 11-1△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
DFC 6, 7	DI RECT PWR AX BY527 1K25V 2A	36610001
DFC 17	LED RAD LG5460GK GREEN 5mm	36910005
DFC 18	IC VREF TL431CLP DI TRC BLK MAC9M 600V 8A	37410012 36471103

## INTEGRATED CIRCUITS



ICFC 1	IC PWR CONT TNY253P	37410032
ICFC 2△	IC OPTO TRIAC TLP763JF	36950010
ICFC 3△	IC OPTO COUPL SFH615A-2	36950009

## FUSES



FFC 1△	FUSE T3,15A HIGH BREAK 5X20MM	43751652
FFC 1	FUSEHOLDER CLIPS 5*20MM R=5,0mm	41540001

## TRANSFORMERS



MFC 2△	MAINS TRAFO 2262.0029B/TM2673	45310006
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## COILS



LFC 1, 2	COIL AX 40uH 2000mA	45620057
LFC 3, 4, 7, 8	COIL SMD 10uH 15mA	45640026
LFC 6, 12	COIL SMD 2,2uH 30mA	45640023
LFC 9	R SMD 0R 0W10	31425802
LFC 10	COIL BLK 10uH 1200mA RAD	45571699
LFC 11	COIL SMD 3,3uH 30mA	45640024
MFC 1△	COIL MAINS BLK TRE293/30H	45390023

## OTHERS



A 2, 4	MODULE HOLDER	81408167
HFC 1	IR-RECEIVER TSOP1838SS3V 3-PIN	36940002
HFC 1	LED SPACER LEDM-3-06	84481682

Item	Description	Order no.
J 1, 3, 6, 7, 8, 10, 11, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 25, 26, 27, 28, 39, 50, 54, 56	JUMPER R=12,5 mm	85600078
J 2, 5, 13, 31, 38, 48, 49, 51, 52, 53, 55	R SMD 0R 0W10	31425802
JFC 2	JUMPER R=12,5 mm	85600078
JFC 3, 14, 15, 16, 17	R SMD 0R 0W10	31425802
LFC 2-1△, 2-2△, 1-1△, 1-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
MFC 1-1△, 1-2△, 1-3△, 1-4△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
SWFC 1, 2, 3, 4	TACTILE SWITCH 4	41150685
UFC 1-1△, 1-2△, 1-3△, 1-4△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
UFC 1△	MAINS SWITCH 250V 6/120A	41210011
XA 5	SIGNAL CABLE 20-PIN 600mm	96010197
XFC 1-1△, 1-2△	CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41930009
XFC 1	ROW CONN 2-PIN VERT LOCK	73184750
XFC 6	CONN RCA 3 IN ROW	41430747
XFC 9	CONN S-VHS	41452244
XFC 10	CONN PHONO 3,5mm	
XO 2-1△, 1-1△	JACK WITH SENSE SWITCH CONN GRIPLET FOR 2-SIDED PCB d=1,9mm	41910001 41930009
XO 2 △	WIREPLUG FOR 2-PIN 410mm	96008011
	COVER FOR CAMERA CONNECTOR	84488890

## PP160 PiP module

## RESISTORS



RPP 1, 2	R SMD 270R 0W10	31490631
RPP 5	R SMD 5K6 0W10	31490649
RPP 6	R SMD 6K8 0W10	31490650
RPP 7, 8, 9	R SMD 10K 0W10	31490652
RPP 10	R SMD 220R 0W10	31490630
RPP 11	R SMD 75R 0W10	31490624
RPP 12, 50, 51, 52, 53, 54, 55, 56, 57	EMI FERRITE BEAD SMD 2500R/100MHz 100mA	46900005
RPP 13, 16, 17, 49	R SMD 100R 0W10	31490626
RPP 14, 27, 28, 29	R SMD 470R 0W10	31425817
RPP 15	R SMD 12K 0W10	31425834
RPP 18, 20	R SMD 33K 0W10	31425840
RPP 19, 40, 46	R SMD 100R 0W10	31425852
RPP 21, 23	R SMD 180K 0W10	31490012
RPP 22, 25, 30, 31, 32, 45, 48	R SMD 100K 0W10	31425844
RPP 24, 26, 41, 42, 43, 44, 47	R SMD 10K 0W10	31425833
RPP 33	R SMD 680K 0W10	31490059
RPP 34, 38	R SMD 120K 0W10	31425845
RPP 35	R SMD 27K 0W10	31425839
RPP 36, 37	R SMD 1M0 0W10	31425801
RPP 39	R SMD 5K6 0W10	31425825

## CAPACITORS



CPP 1, 21, 30	C ECAP RAD 47U 16V	34223251
CPP 2	C CER2 SMD 22N 25V	32790026
CPP 3, 4	C CER2 SMD 10N 50V	32200102

Item	Description	Order no.
CPP 5, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 29, 37	C CER2 SMD 100N 16V	32200117
CPP 6, 7	C CER1 SMD 27P 50V	32200040
CPP 19	C ECAP RAD 100U 16V	34223252
CPP 22, 34, 35, 36	C CER2 SMD 100N 25V	32190001
CPP 23, 24, 25, 26, 27, 28	C ECAP RAD 22U 35V	34540021
CPP 31	C CER2 SMD 10N 50V	32536213
CPP 32, 33	C CER1 SMD 2N250V	32190026
CPP 38, 39	C CER1 SMD 100P 50V	32200054

## TRANSISTORS



TPP 1	TR NPN SMD BC847B 45V	36145312
TPP 2, 3, 4, 5, 6, 7	N-FET SMD 2N7002 60V 180mA	36380002
TPP 8	TR NPN SMD BC848B 30V	36145322

## INTEGRATED CIRCUITS



ICPP 1	IC VIDEO SMD DRX3960A-F5	37850242
ICPP 2	IC V-REG SMD LP2981 3V3	37460045
ICPP 3, 4	IC OPAMP SMD TL082CD 8	37470003

## COILS



LPP 1	COIL SMD 1.0uH 245mA	45620051
LPP 4, 5, 6	COIL SMD 10uH 15mA	45640026
LPP 2, 3, 7, 8	COIL BLK 10uH 1200mA RAD	45571699

## FILTERS



ZPP 1	SAW FILTER X6966D 36,125MHz	45740038
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## CRYSTALS



ZPP 2	CRYSTAL BLK 20.250 MHz	45730011
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## OTHERS



J 1	JUMPER R=7,5 mm	85600054
J 2, 12	JUMPER R=20,0 mm	85600102
J 3	EMI FERRITE BEAD SMD 2500R/100MHz 100mA	46900005
J 4, 5	R SMD 0R	31490600
J 6, 7, 13, 14	R SMD 0R 0W10	31425802
J 8, 15	JUMPER R=12,5 mm	85600078
J 11	JUMPER R=15,0 mm	85600085
TU 1	TUNER UV1316T/S IH-3	58231069
X 1, 2	CONN MODULE 7-PIN 9LOCK	41720049
X 3	CONN RCA ANT CABLE ASSY 200mm RCA/IEC	41910019 47780022

## AJ106 Crossover network module\*

## RESISTORS



RAJ 1	R METOX BK 4R7 1W5 RAD	31450004
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## CAPACITORS



CAJ 1	C ECAP BLK 4U7 50V	34540034
CAJ 2	C ECAP BLK 4U7 50V	34540034

## COILS



LAJ 1	COIL 36-18 1mH	93002510
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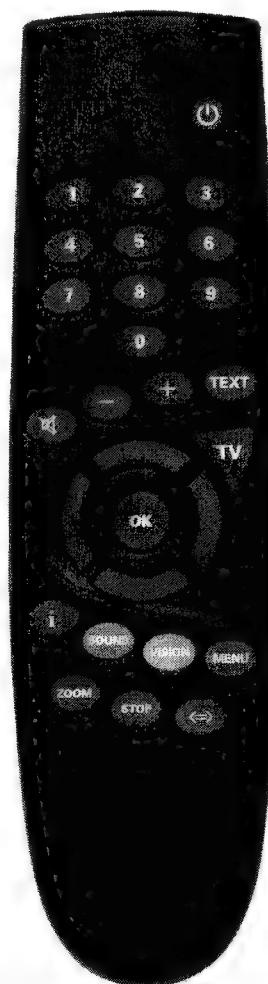
## OTHERS



XAJ 1	ROW CONN 3-N VERT LOCK	73190603
TW-	WIRE 400mm BLACK	96010170
TW+	WIRE 400mm BROWN	96010171
MB+	WIRE 350mm RED	96010205
MB-	WIRE 350mm GREEN	96010206

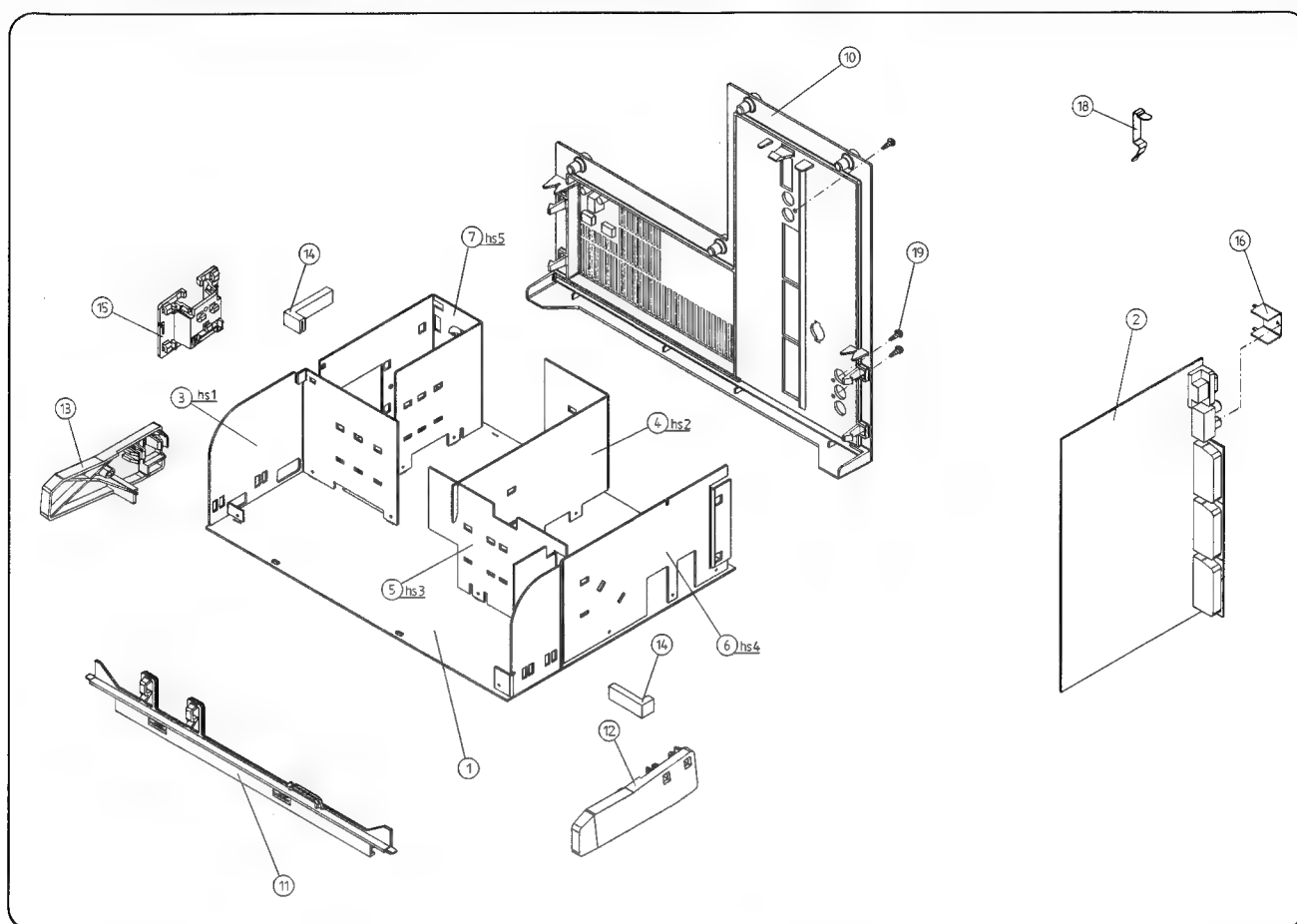
## RCU100 Remote Control

REMOTE CONTROL UNIVERSUM	RCU100
BATTERY COVER	84433430

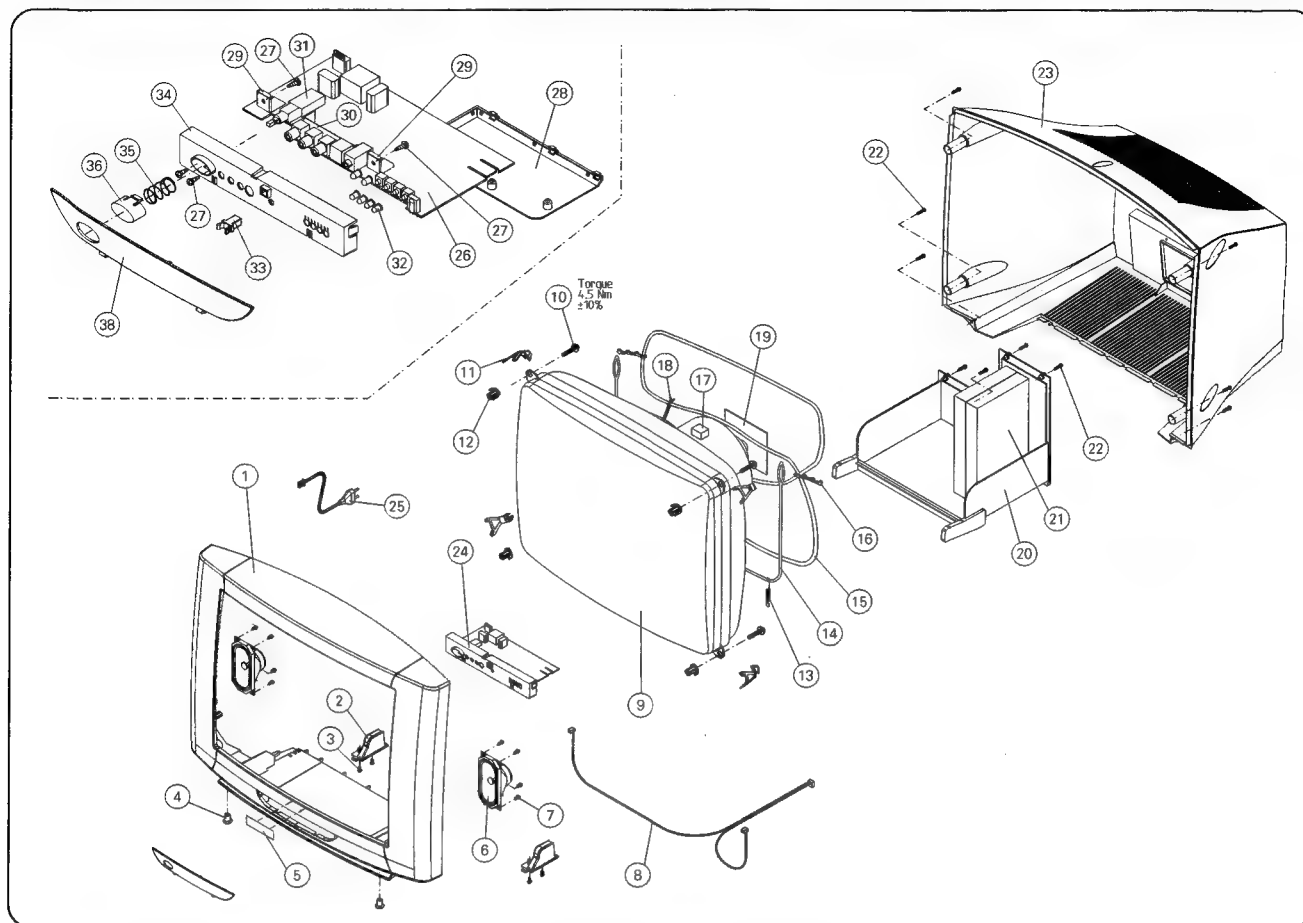




## Mechanical parts, chassis



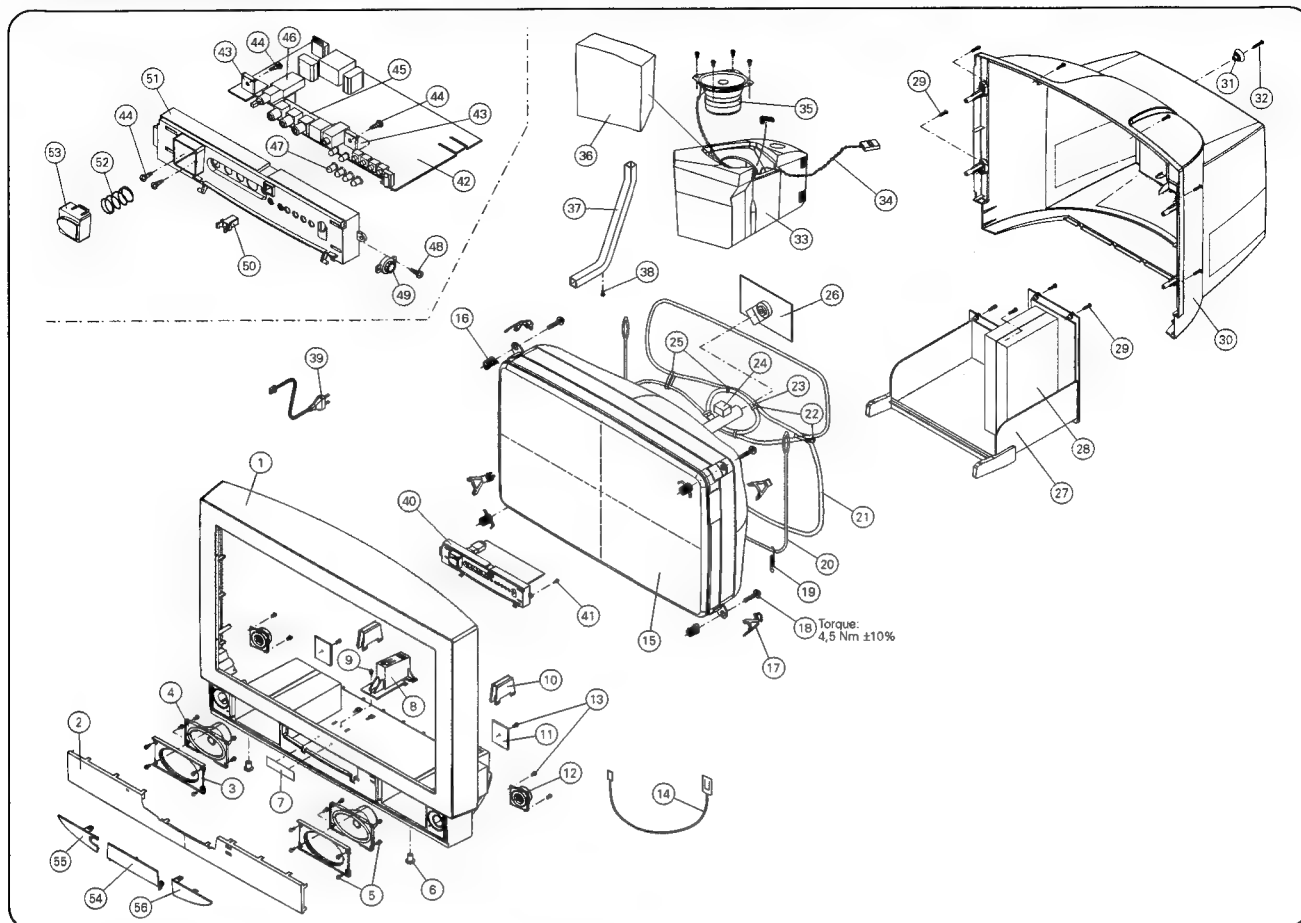
Item	Description	Order no.	Item	Description	Order no.
<b>MODULES</b>			12	CHASSIS HOLDER LEFT	80409535
1	MAIN BOARD	TN/TW***** AV16*	13	CHASSIS HOLDER RIGHT	80409559
2	SIGNAL MODULE		14	CONNECTING PIECE	84488881
<b>METAL PARTS</b>			15	CONNECTING PLATE 28"	84488470
3	HEAT SINK 1	84830830	<b>SPRINGS, SCREWS</b>		
4	HEAT SINK 2	84830910	18	HEAT SINK SPRING	79400021
5	HEAT SINK 3	84830920	19	PT-SCREW KB30x8 (2 AUDIO OUT, 1 AUDIO IN)	78360002
6	HEAT SINK 4b	84830870			
7	HEAT SINK 5	84830900			
16	AV MODULE BRACKET	84481920			
<b>PLASTIC PARTS</b>					
10	COVER PLATE FOR CONNECTOR AREA A (3 x SCART, VGA + AUDIO IN) - Universum FT7121	84401230			
	C (2 x SCART, NO VGA + AUDIO IN) - Universum FT7120	84401210			
11	WIRE HOLDER	84486070			



Item	Description	Order no.	Item	Description	Order no.
1	△ CABINET V-0 28V3 POLAR SILVER	85101500	25	△ MAINS CABLE +CONNECTOR 2.25m	70003769
2	CHASSIS BRACKET	84488920	26	CONTROL UNIT MODULE	FC110
3	PT-SCREW KB 40X10 FOR CHASIS BRACKET	WC0353	27	PT-SCREW KB30X8	WC0371
4	FOOT PAD 14.6mm NATURA	80424027	28	△ FIRE BARRIER FOR CONTROL UNIT	84860450
5	BADGE UNIVERSUM	66390050	29	MODULE SUPPORT	81408167
6	LOUDSPEAKER 57X126mm 8 10W	43120022	30	△ COVER FOR CAMERA CONNECTOR	84488890
7	PT-SCREW KB 40X10 FOR LOUDSPEAKERS	WC0353	31	△ MAINS SWITCH 250V 6/120A	41210011
8	LOUDSPEAKERS WIRE BUNDLE	96010145	32	PUSH BUTTON	63157040
9	△ PICTURE TUBE Phi A66EAK075X44 100Hz AK	43642849	33	FLAP LOCK	80413473
10	PT-SCREW 7X30 FOR PICTURE TUBE	62034039	34	CONTROL UNIT FRAME	84451260
11	DEGAUSSING COIL HOLDER	84488950	35	COMPRESSION SPRING	UC3051
12	PICTURE TUBE HOLDER	84480810	36	MAINS BUTTON	84630830
13	GROUNDING SPRING	81401082	38	FLAP V3 100Hz Safety++	84501700
14	GROUNDING WIRE	96010090		EXTENSION FOR MAINS BUTTON	84630760
15	△ DEGAUSSING COIL	45820039	△	WIRE BUNDLE V-DEFLECTION 550mm	96008120
16	DEGAUSSING COIL HOLDER	84488790	△	WIRE BUNDLE H-DEFLECTION	96010059
17	FELT PAD	80440385	△	ANODE CABLE 570mm +CHIMNEY	96008868
18	DEGAUSSING COIL TIGHTENER	80424133	△	FOCUS CABLE 1,2 410MM	96010230
19	△ CRT MODULE	HH203	△	DST CABLE 280MM	96011091
20	△ CHASSIS	TNBRAAA		PIP MODULE	PP160
21	SIGNAL MODULE	AV165		REMOTE CONTROL UNIVERSUM	RCU100
22	PT-SCREW KB 40X20	WC0354		BATTERY COVER	84433430
23	△ BACK COVER V-0 28V3 LIGHT GREY	83303930			
24	CONTROL UNIT	SY126			

## Mechanical parts 32" X6

FT7121 Prod.-Nr. 528.112 6



Item	Description	Order no.	Item	Description	Order no.
1	▲ CABINET V-0 32X6 POLAR SILVER	8201810A	34	SUBWOOFER WIRE BUNDLE	96008820
2	GRILL 32	84603880	35	SUBWOOFER LOUDSPEAKER 8 15W	43120024
3	LOUDSPEAKER MOUNTING PLATE	84401200	36	DAMPER	UA1668
4	LOUDSPEAKER 70X130 8	43120005	39	▲ MAINS CABLE +CONNECTOR 2.25m	70003769
5	PT-SCREW KB40X10	WC0353	37	SUBWOOFER BOX HOLDER	81408105
6	FOOT PAD 14.6mm NATURA	80424027	40	CONTROL UNIT	SY122
7	BADGE UNIVERSUM	66390050	38	SCREW 5X9.5 FOR SUBWOOFER MOUNTING	WC0308
8	CHASSIS BRACKET	84488820	41	PT-SCREW KB 35X12, BLACK	62039239
9	PT-SCREW KB40X8 FOR CHASSIS BRACKET	WC0368	42	CONTROL UNIT MODULE	FC110
10	CHASSIS HOLDER	84488440	43	MODULE SUPPORT	81408167
11	CROSSOVER NETWORK	AJ106	44	PT-SCREW KB30X8	WC0371
12	TWEETER 51X51 8	33004365	45	▲ COVER FOR CAMERA CONNECTOR	84488890
13	PT-SCREW KB40X8	WC0368	46	▲ MAINS SWITCH 250V 6/120A	41210011
14	GROUNDING WIRE FOR GRILL	96010210	47	PUSH BUTTON	63157040
15	▲ PICTURE TUBE Phi W76ERF042X044 100Hz TF*	43643212	48	PT-SCREW KB25X8	78360040
16	PICTURE TUBE HOLDER	84480810	49	FLAP DAMPER	84488870
17	DEGAUSSING COIL HOLDER	84488950	50	FLAP LOCK	80413473
18	PT-SCREW 7X40 FOR PICTURE TUBE	WC2027	51	CONTROL UNIT FRAME	84461180
19	GROUNDING SPRING	81401082	52	COMPRESSION SPRING	UC3051
20	GROUNDING WIRE	96010091	53	MAINS BUTTON	84680770
21	▲ DEGAUSSING COIL	45820038	54	FLAP X6 Safety++	84501610
22	WIRETIE 190MM	65221205	55	LENS LEFT SIDE	84553550
23	▲ COMPENSATION COIL 220mm	45820005	56	LENS RIGHT SIDE	84553590
24	FELT PAD	80440385		PICTURE TUBE SUPPORT	84489040
25	DEGAUSSING COIL TIGHTENER	80424133		EXTENSION FOR MAINS BUTTON	84680760
26	▲ CRT MODULE	HH201		LOUDSPEAKERS WIRE BUNDLE	96010145
27	▲ CHASSIS	TWARCAA	▲	WIRE BUNDLE V-DEFLECTION 550mm	96008120
28	SIGNAL MODULE	AV163	▲	WIRE BUNDLE H-DEFLECTION	96010059
29	PT-SCREW KB 40X20	WC0354	▲	ANODE CABLE 630mm + CHIMNEY	96008869
30	▲ BACK COVER V-0 32X6 LIGHT GREY	84303790	▲	FOCUS CABLE 410mm	96010220
31	PLUG FOR SUBWOOFER MOUNTING	UL0104	▲	FOCUS CABLE 1,2 410MM	96010230
32	PT-SCREW KB 40X40 FOR SUBWOOFER MOUNTING	WC0429		PIP MODULE	PP160
33	SUBWOOFER V-0	SCE076		REMOTE CONTROL UNIVERSUM	RCU100
				BATTERY COVER	84433430

## \* PLEASE NOTE:

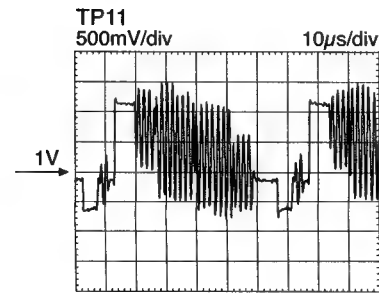
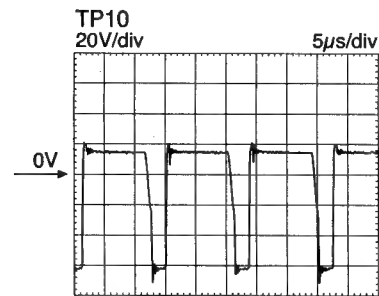
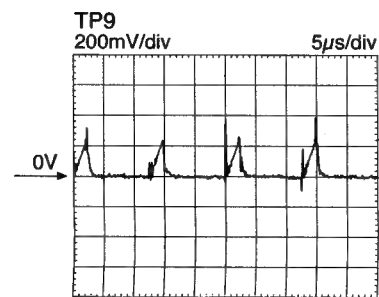
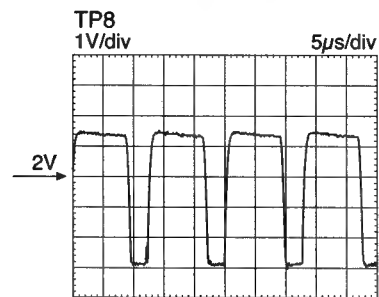
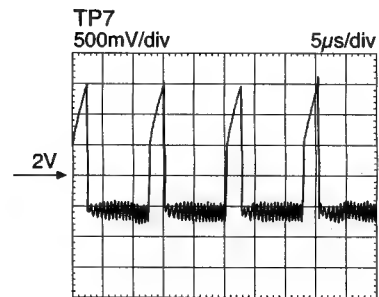
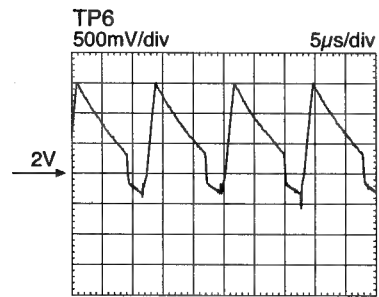
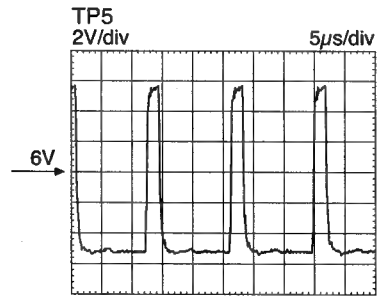
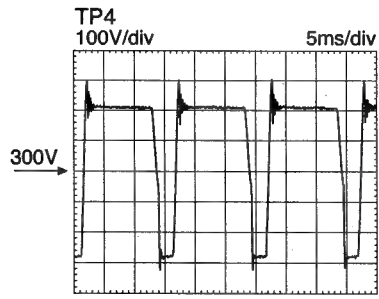
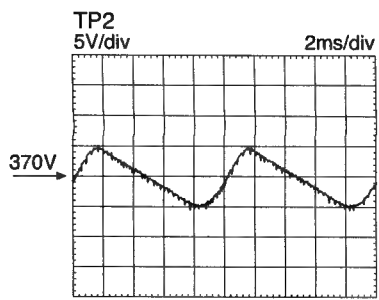
DO NOT ADJUST THE POTENTIOMETERS ON THE CONVERGENCE CORRECTION MODULE OF THE PHILIPS TRUE FLAT PICTURE TUBE (TYPES W66ERF & W76ERF). ADJUSTMENT OF THESE POTENTIOMETERS WILL VOID THE WARRANTY FOR THE PICTURE TUBE.

## \* BEACHTEN SIE BITTE:

DIE POTENTIOMETER DES KONVERGENZ-KORREKTIONSMODULES DER PHILIPS "TRUE FLAT"-BILDRÖHRE (TYPEN W66ERF & W76ERF) DÜRFEN NICHT VERSTELLT WERDEN. BEI VERSTELLUNG DIESER POTENTIOMETER ERLÖSCHEN DIE GARANTIEANSPRÜCHE AUF DIE BILDRÖHRE.

## Notes

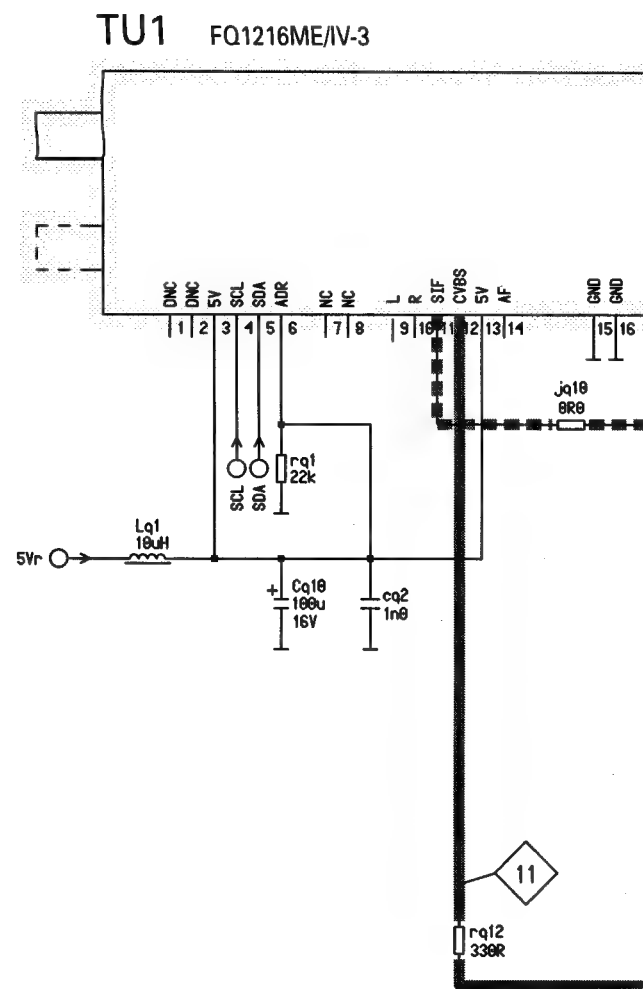
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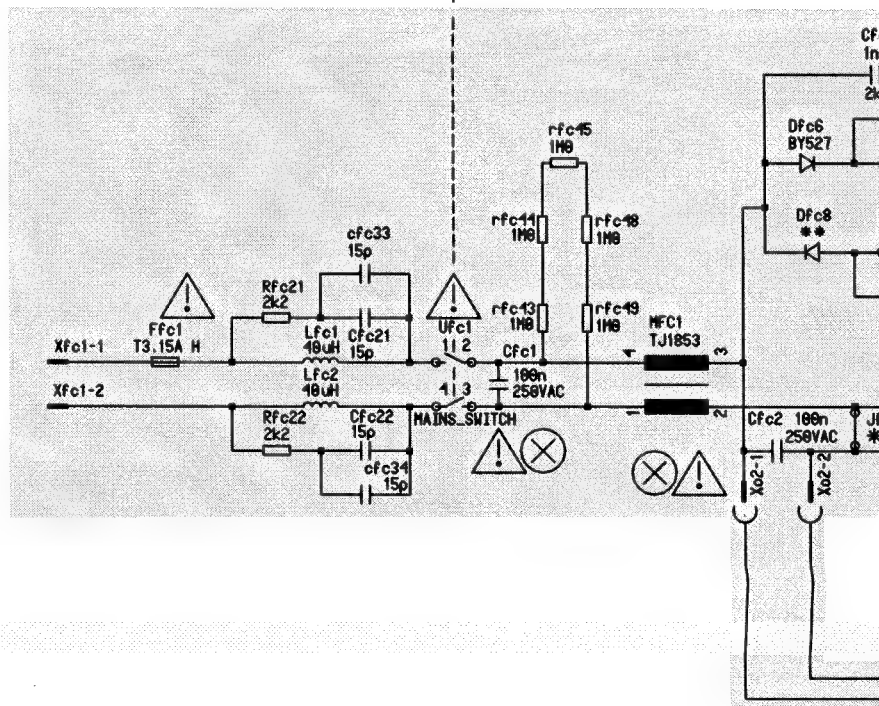
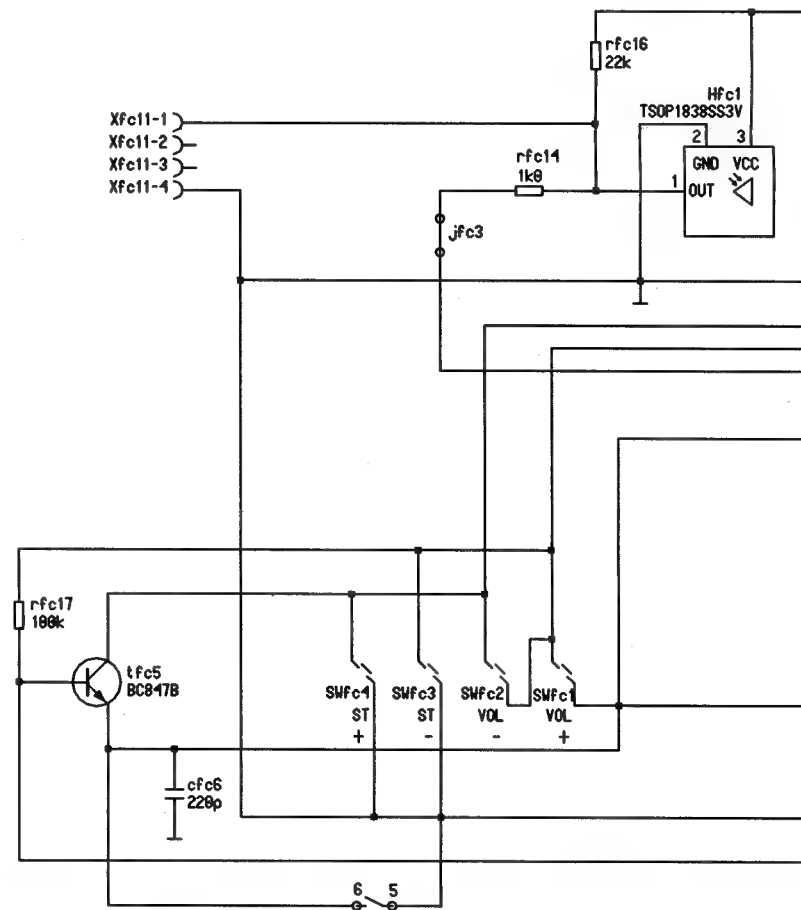
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 - - - - - Chroma signal  
 - - - - - Sound IF signal  
 \_\_\_\_\_ Audio signal (L)  
 \_\_\_\_\_ Audio signal (R)  
 - - - - - Subwoofer signal  
 \_\_\_\_\_ RGB or UV signal  
 \_\_\_\_\_ Horizontal deflection signal  
 \_\_\_\_\_ Vertical deflection signal  
 - - - - - E-W raster correction signal

\* not used  
 \*\* version component  
 ⚠ safety component,  
 must be replaced only with original parts.

VERSION 9  
**CHASSIS**  
**MC2B SERIES**  
**100Hz**



### FC110 (CONTROL UNIT MODULE)

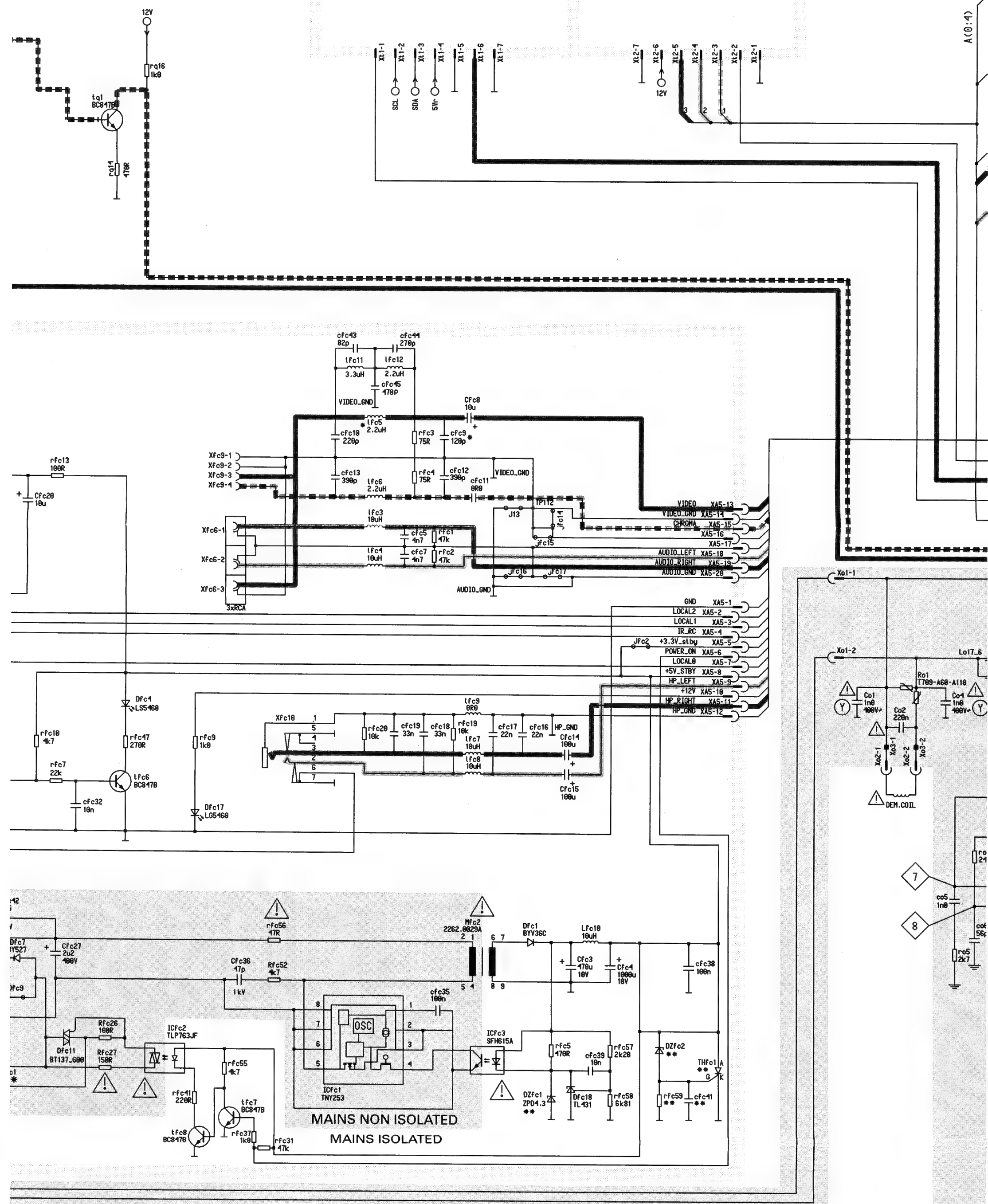


## PP160

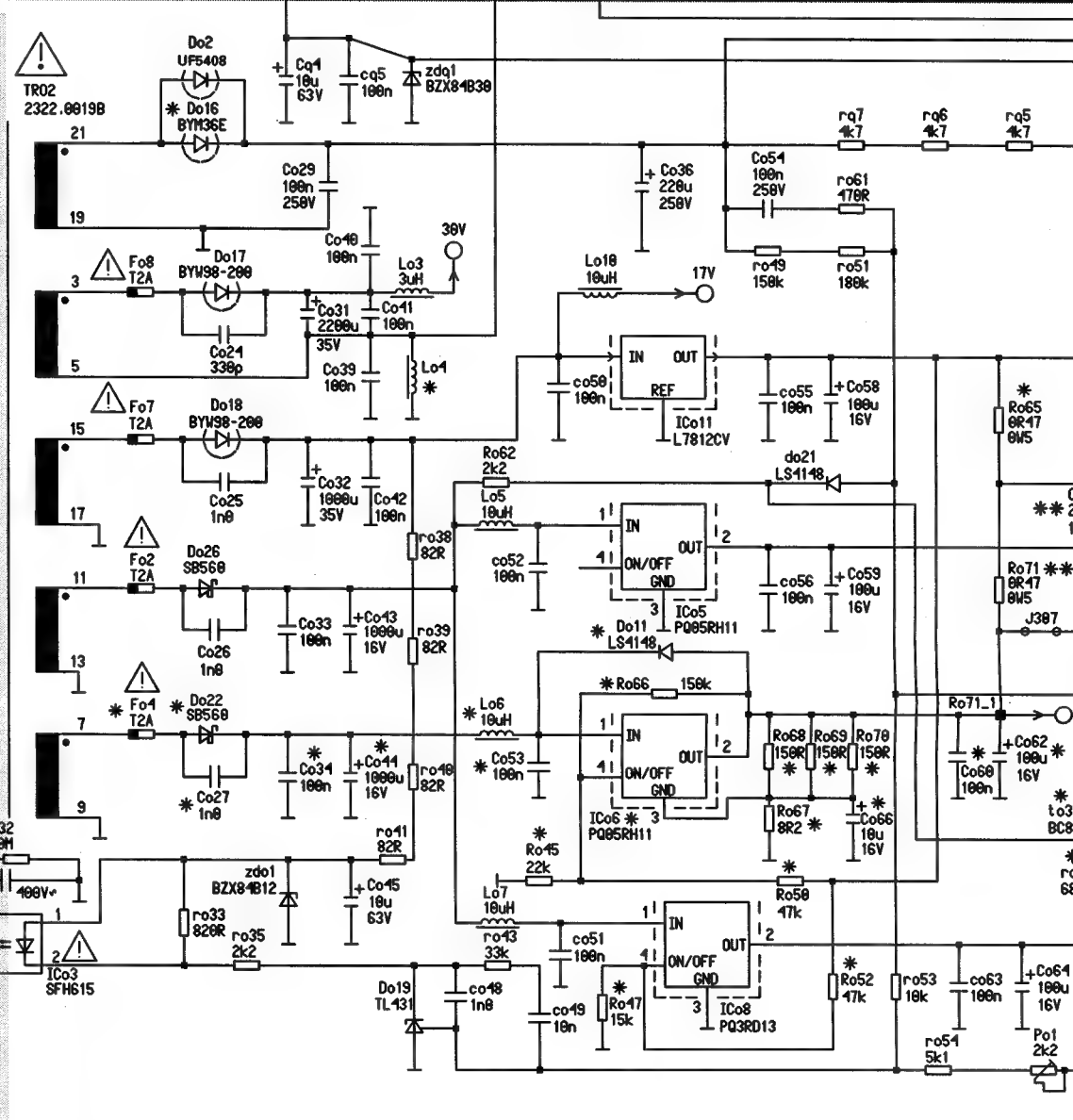
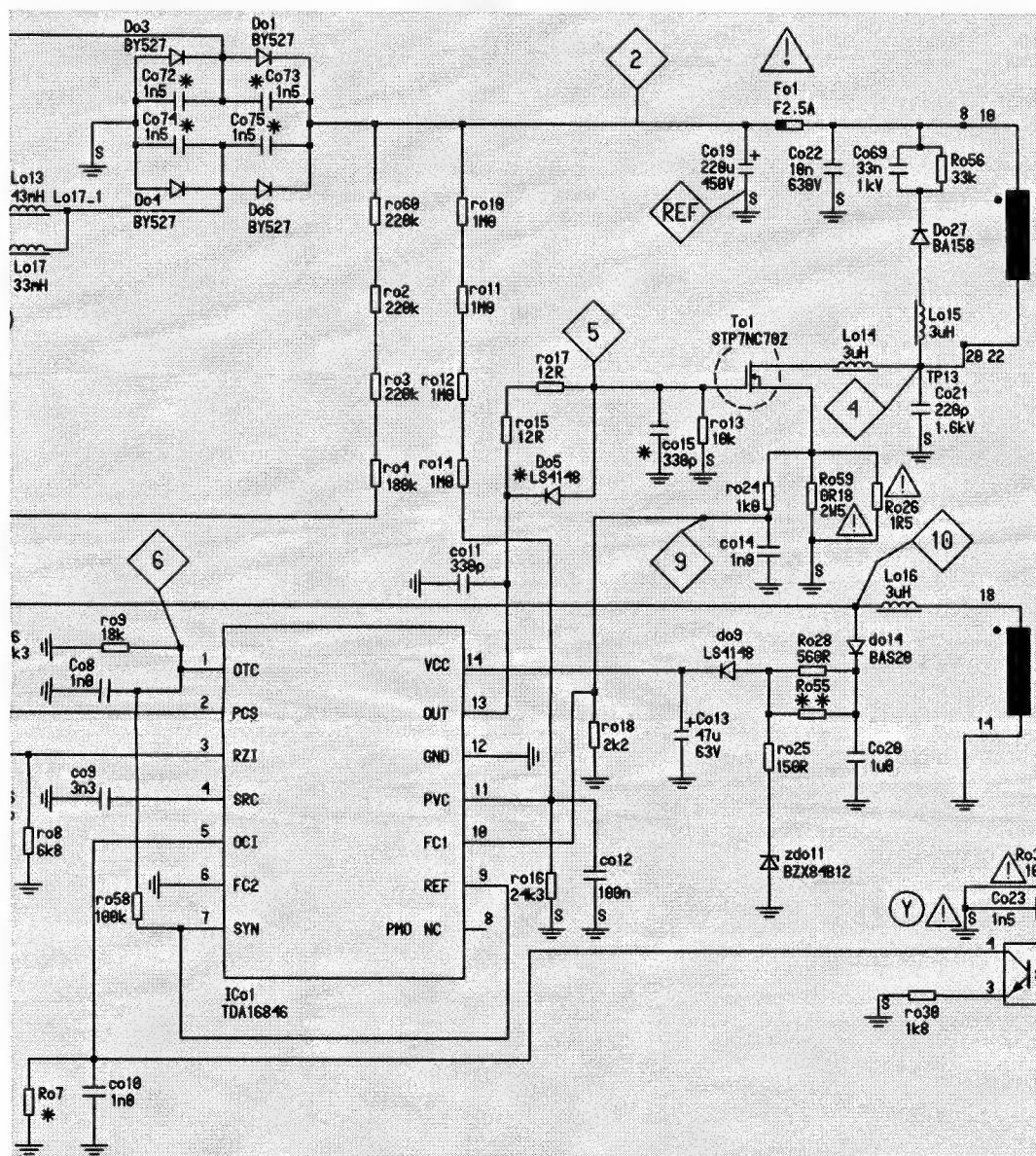
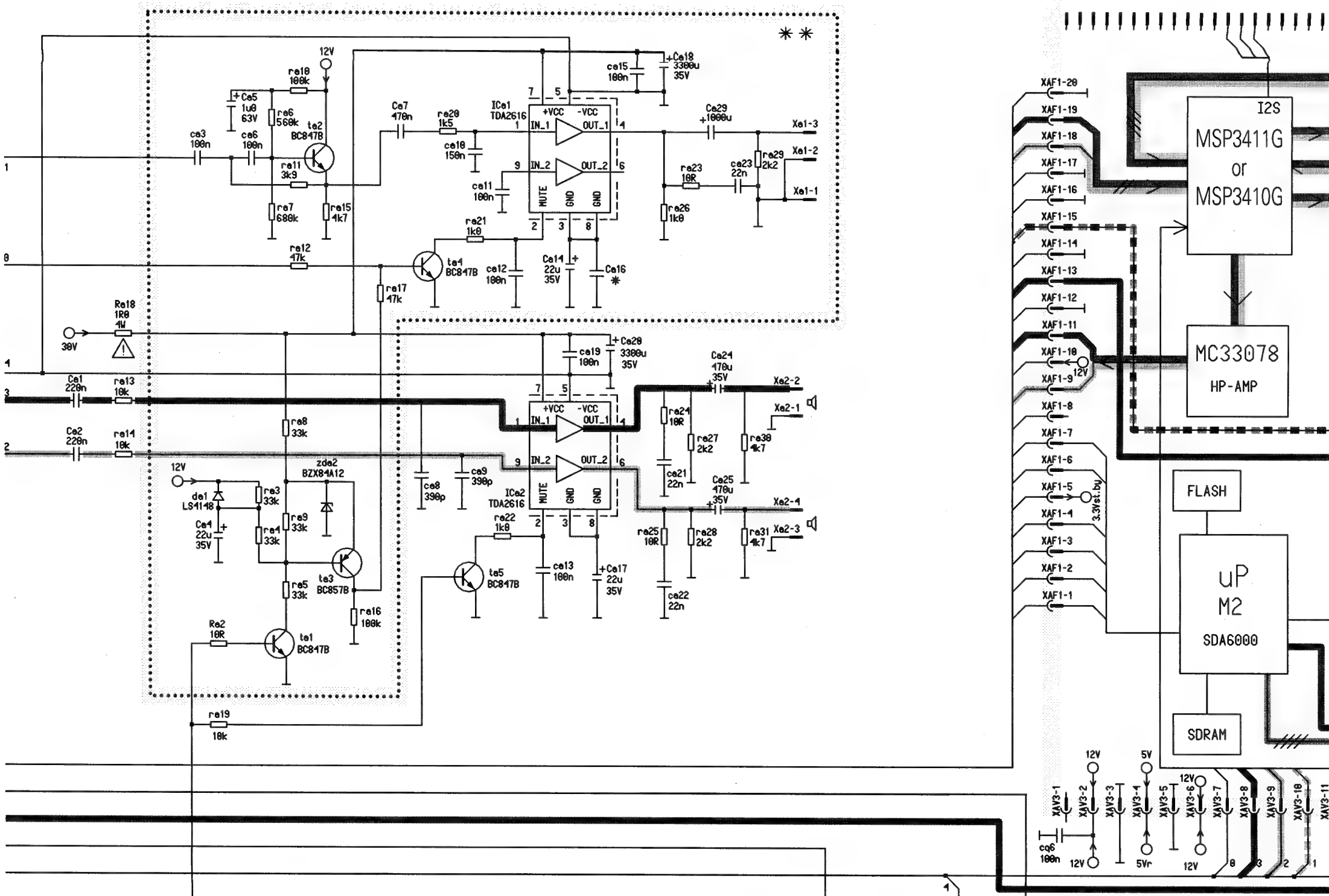
(PICTURE IN PICTURE MODULE)

## TA100

(AUDIO LINE OUTPUT MODULE)

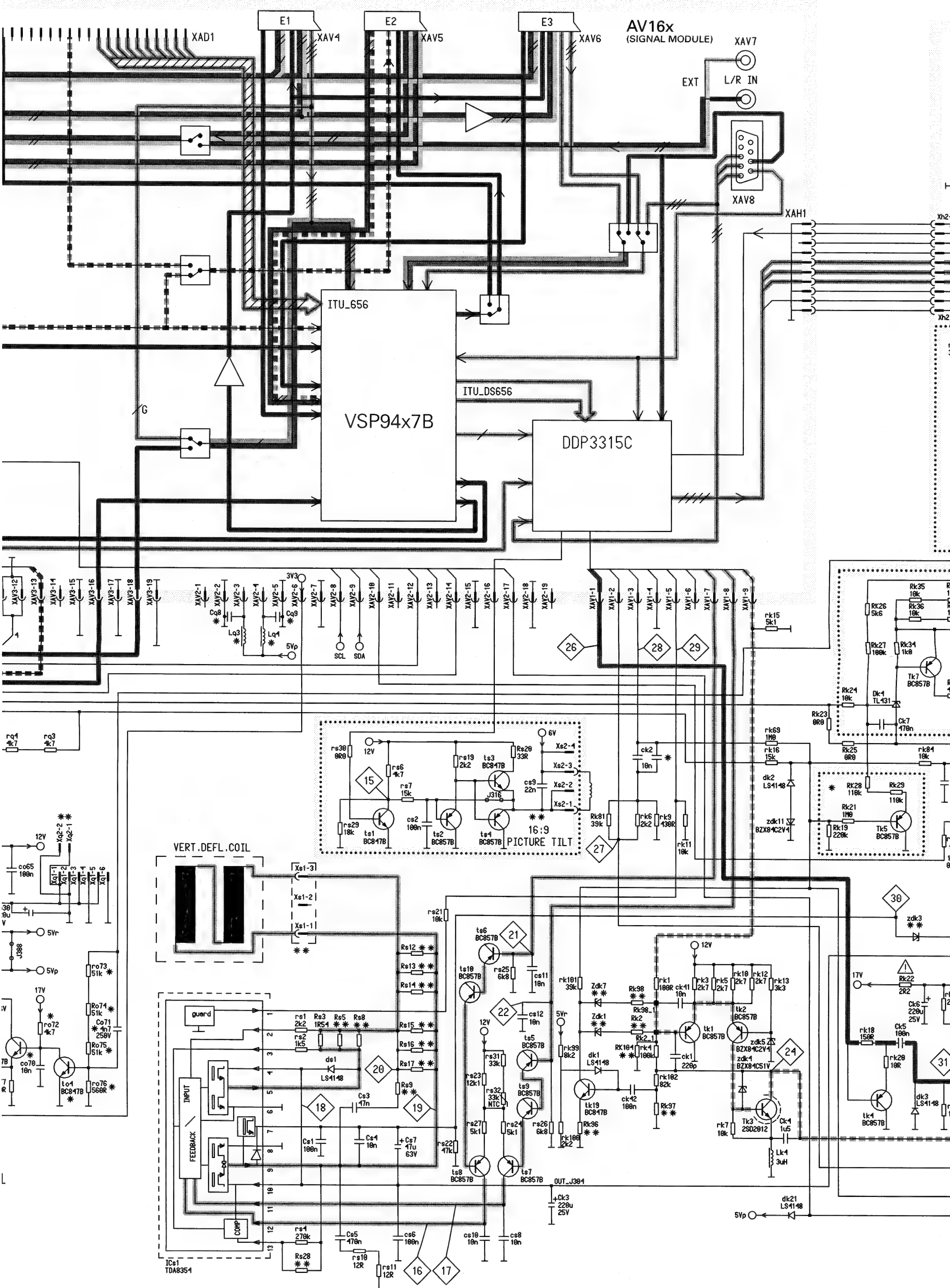






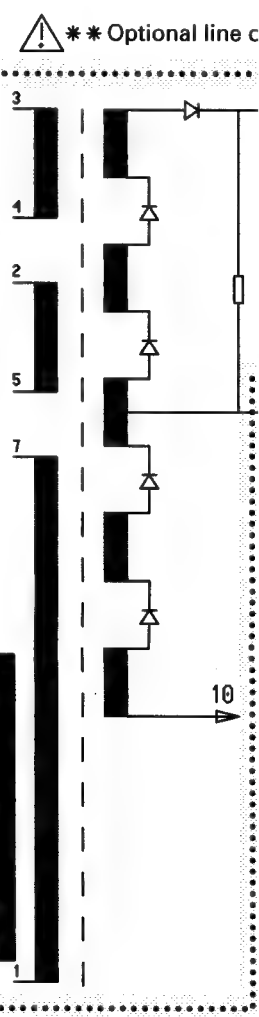
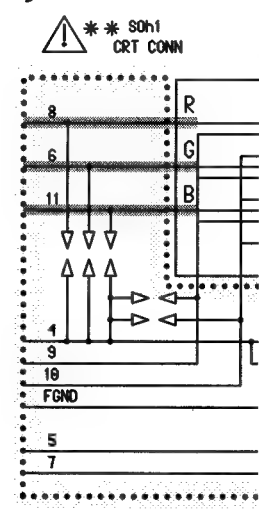
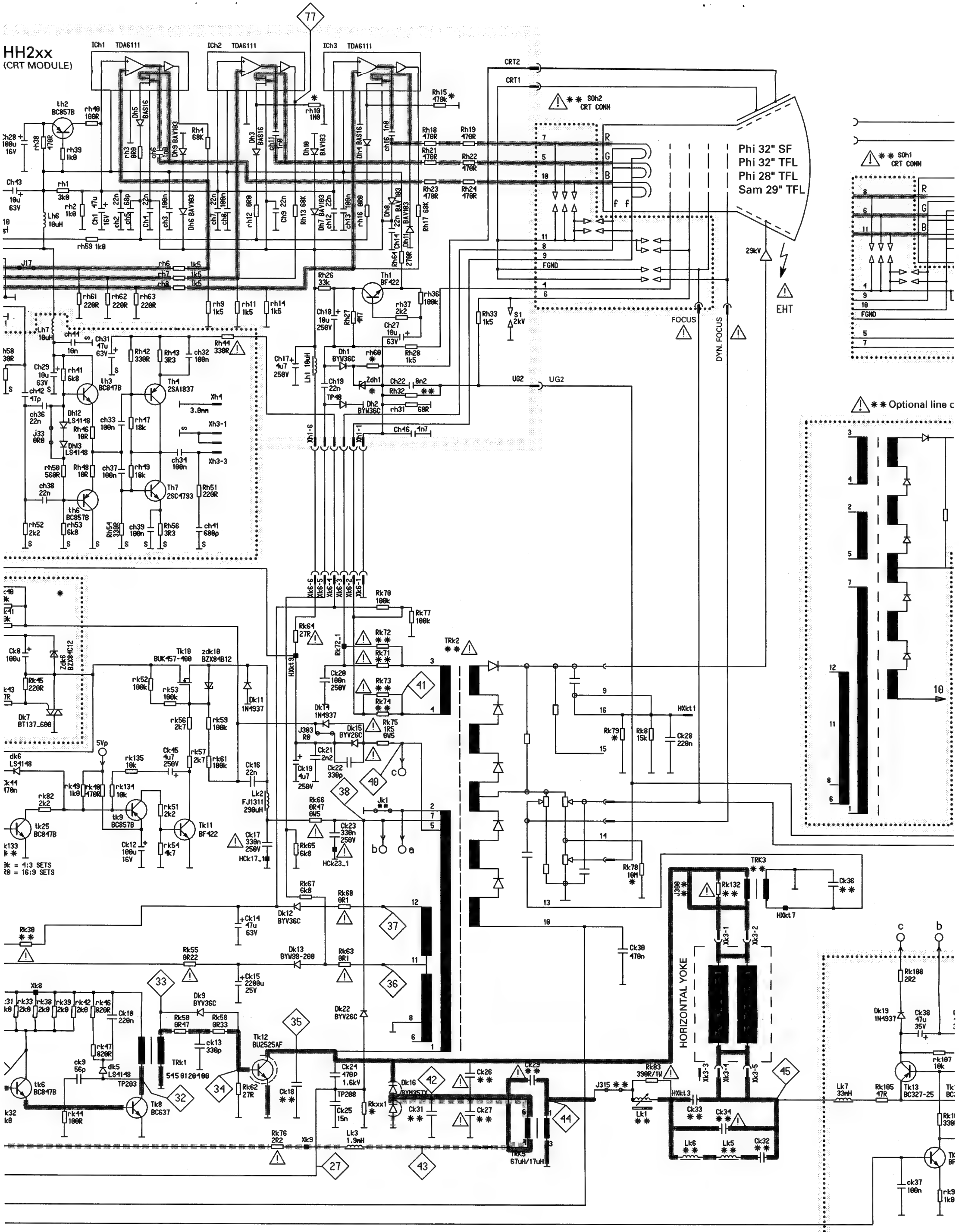
MAINS NON ISOLATED

MAINS ISOLATED





HH2xx  
(CRT MODULE)

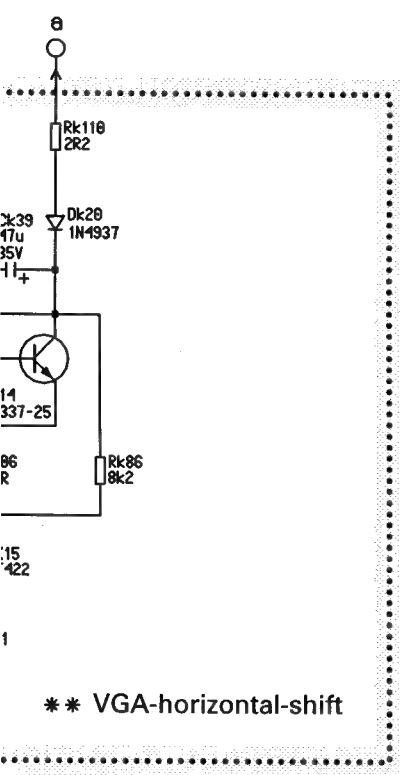
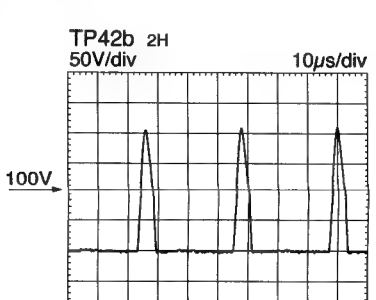
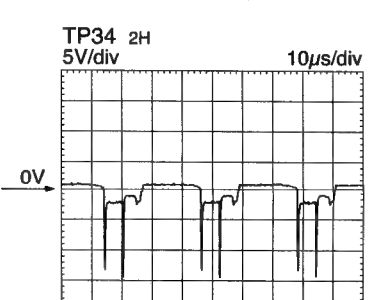
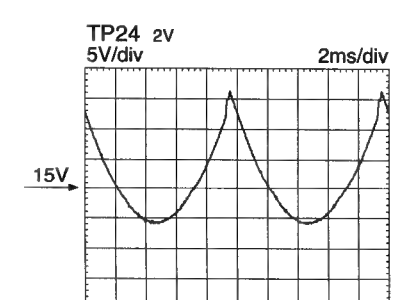
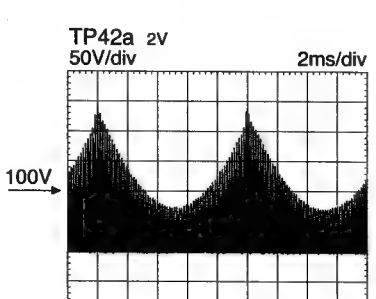
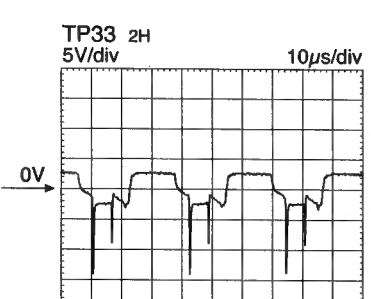
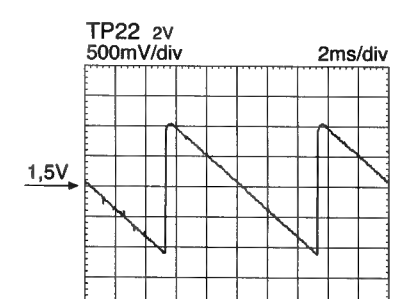
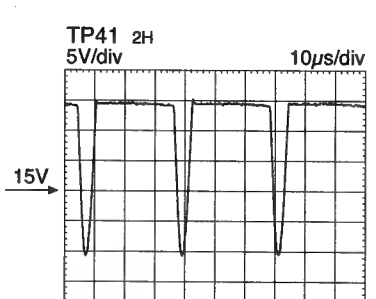
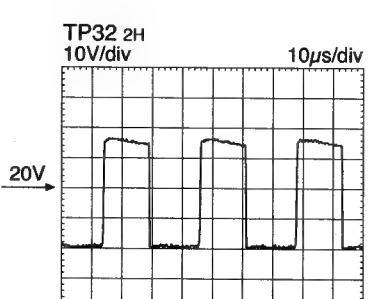
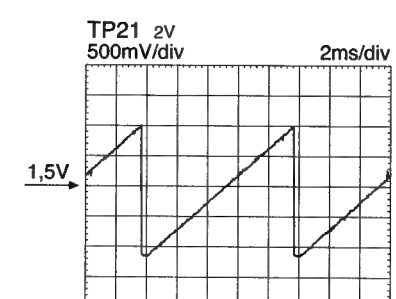
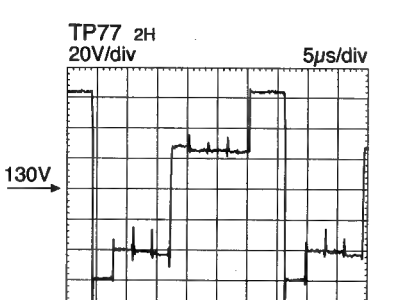
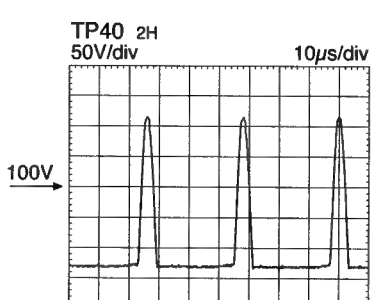
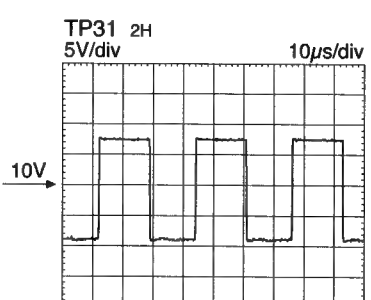
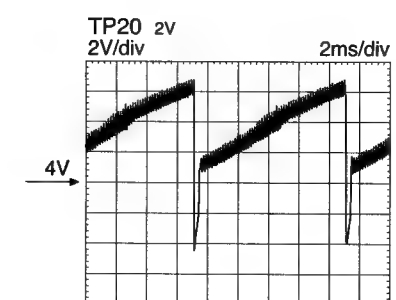
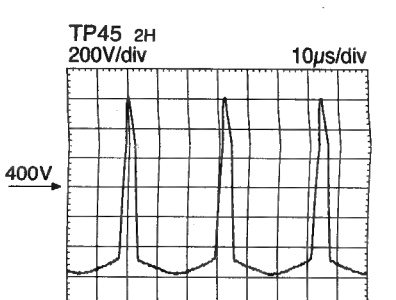
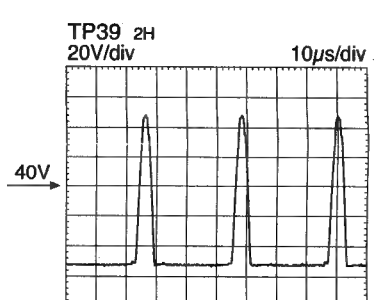
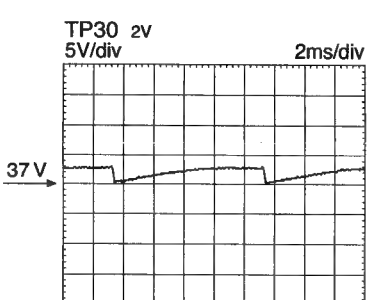
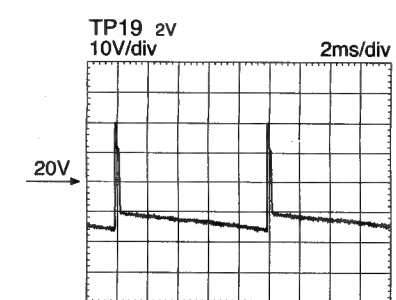
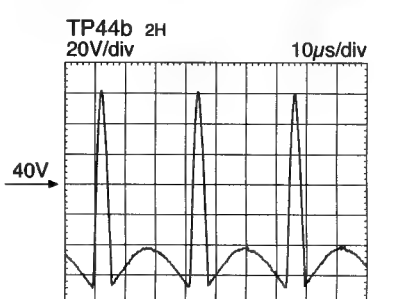
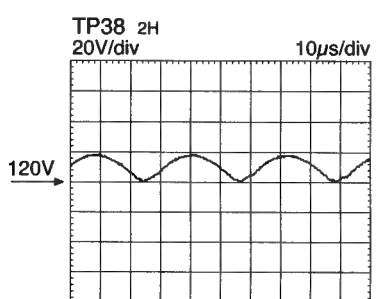
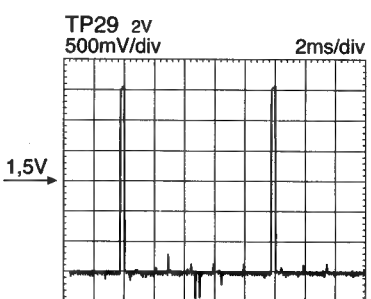
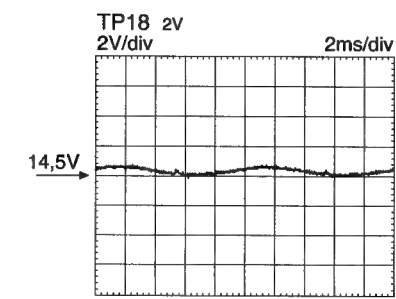
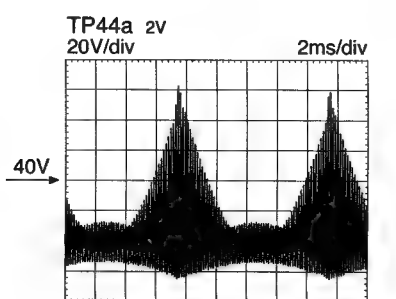
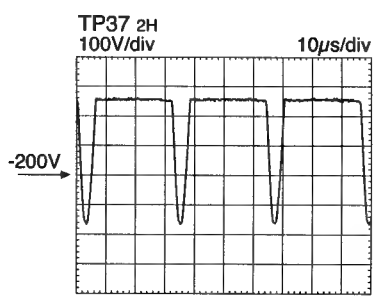
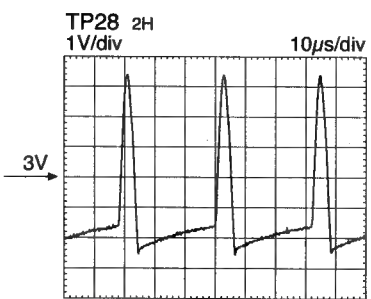
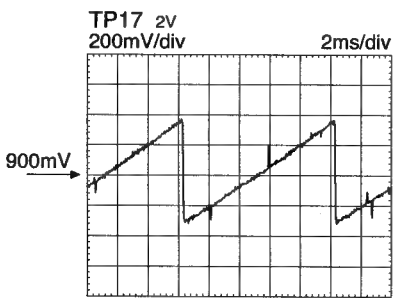
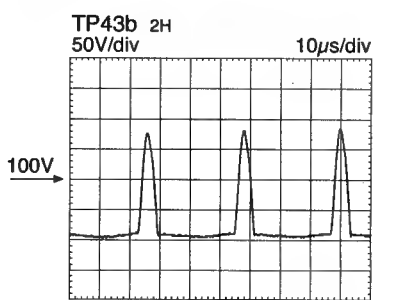
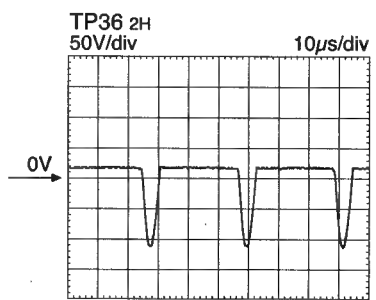
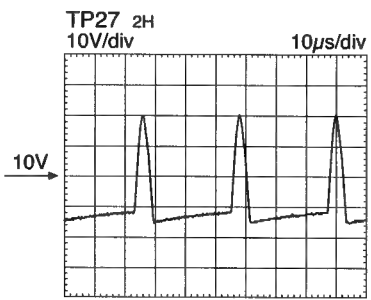
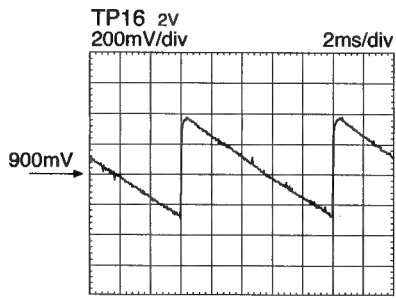
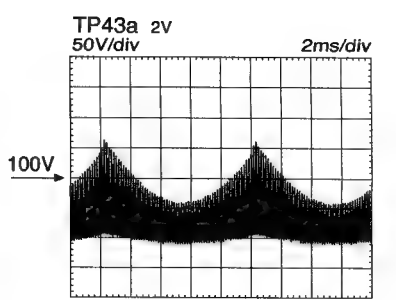
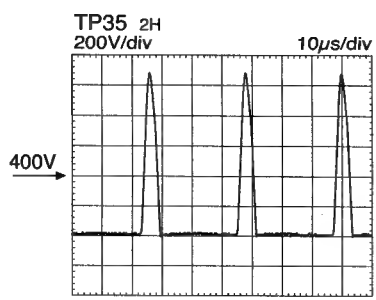
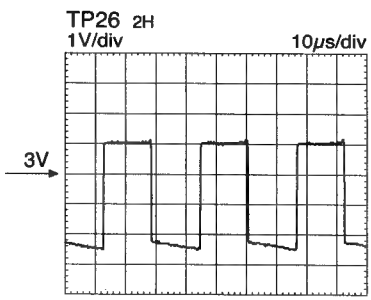
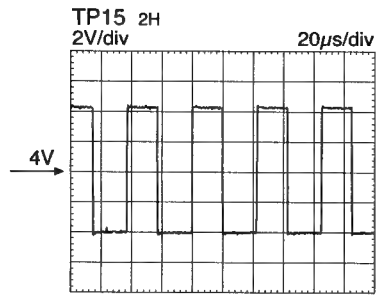
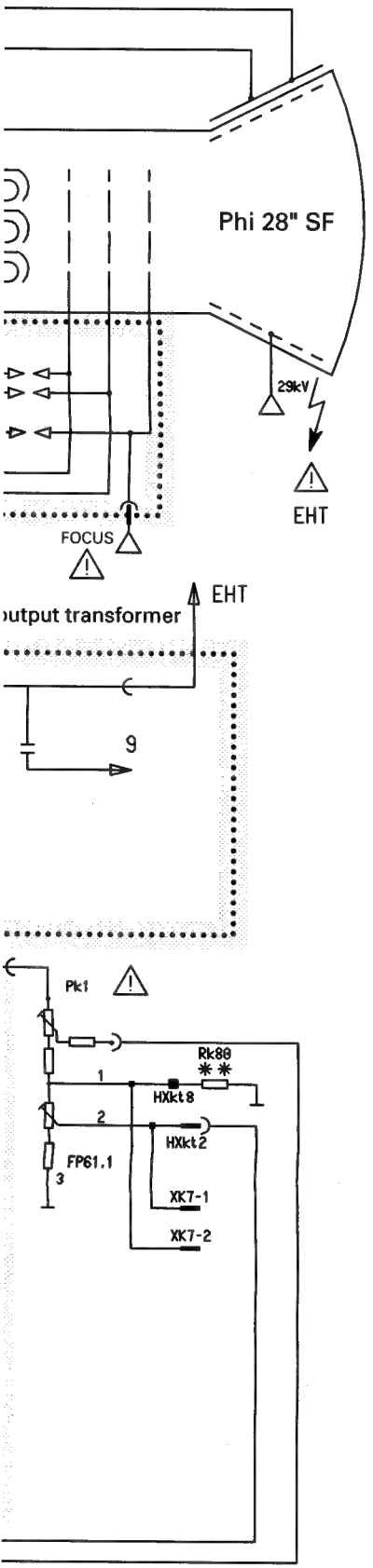


\* = 4:3 SETS  
20 = 16:9 SETS

33 34 35 36 37 38 39 40 41 42 43 44 45

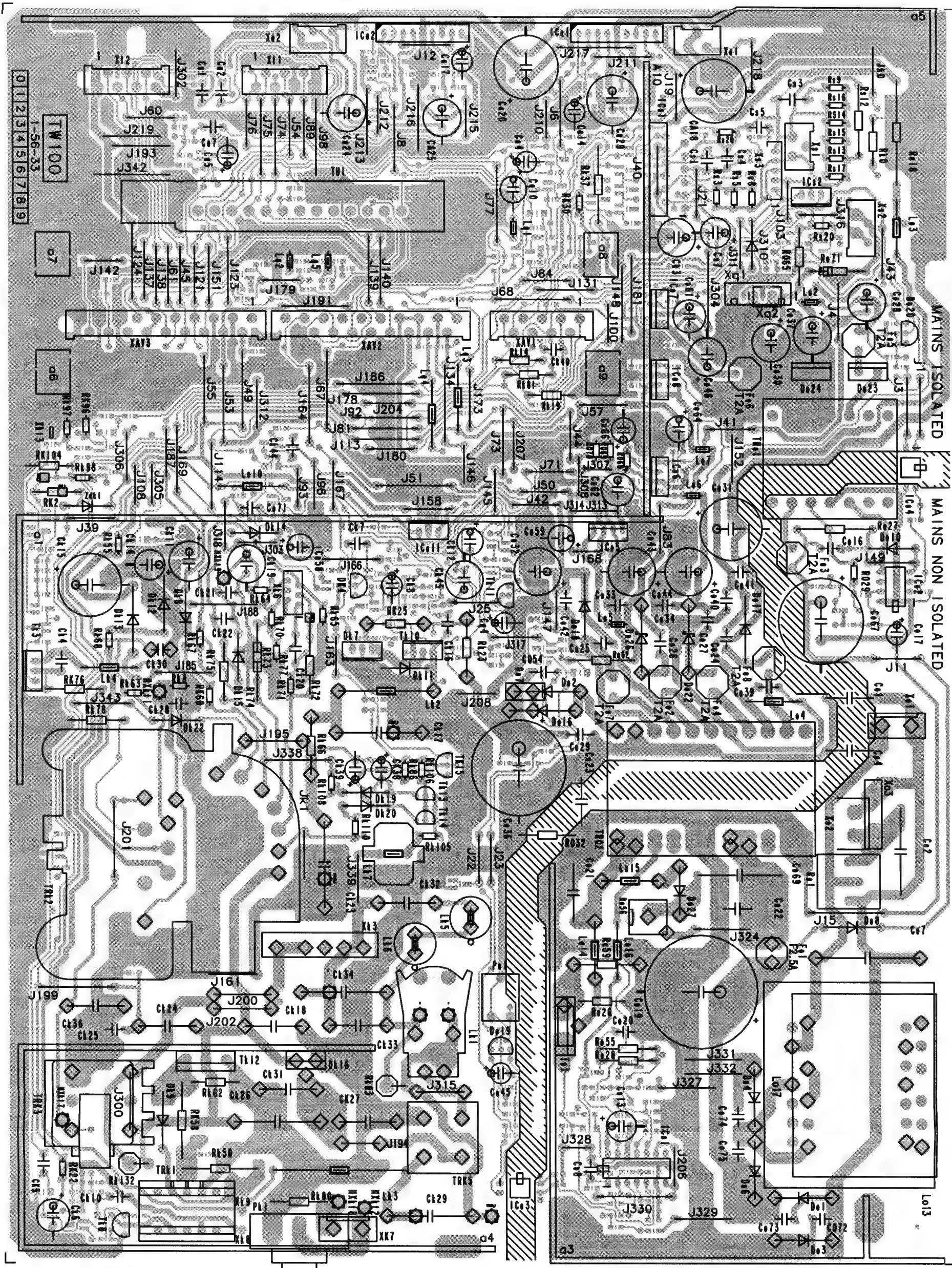
31 32 33 34 35 36 37 38 39 40 41 42 43 44 45

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45



\*\* VGA-horizontal-shift





VERSION 3

**TN/TW CHASSIS  
MC2B SERIES  
100Hz**

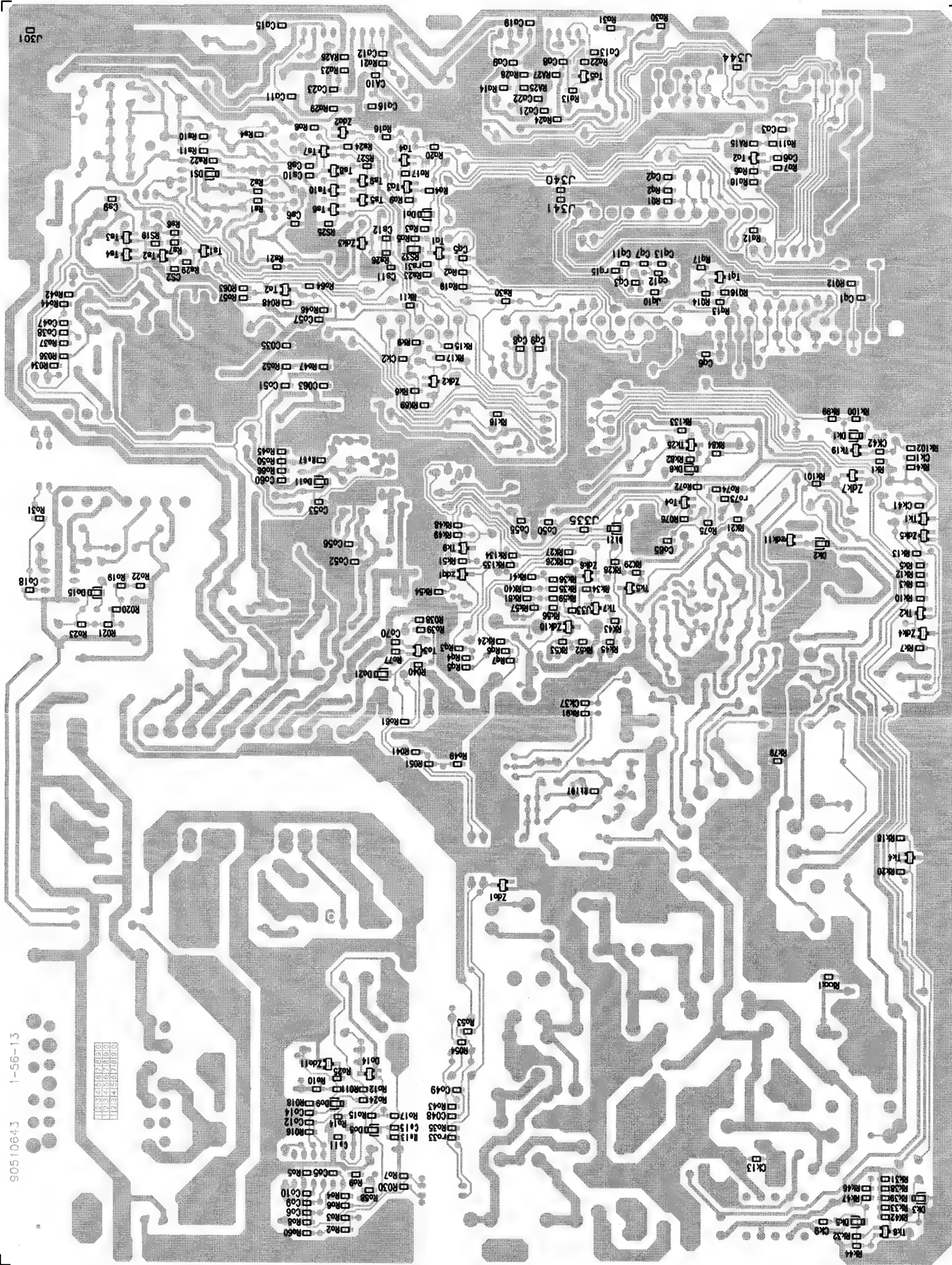
◊ Griplet 1.9mm ▲

66117322

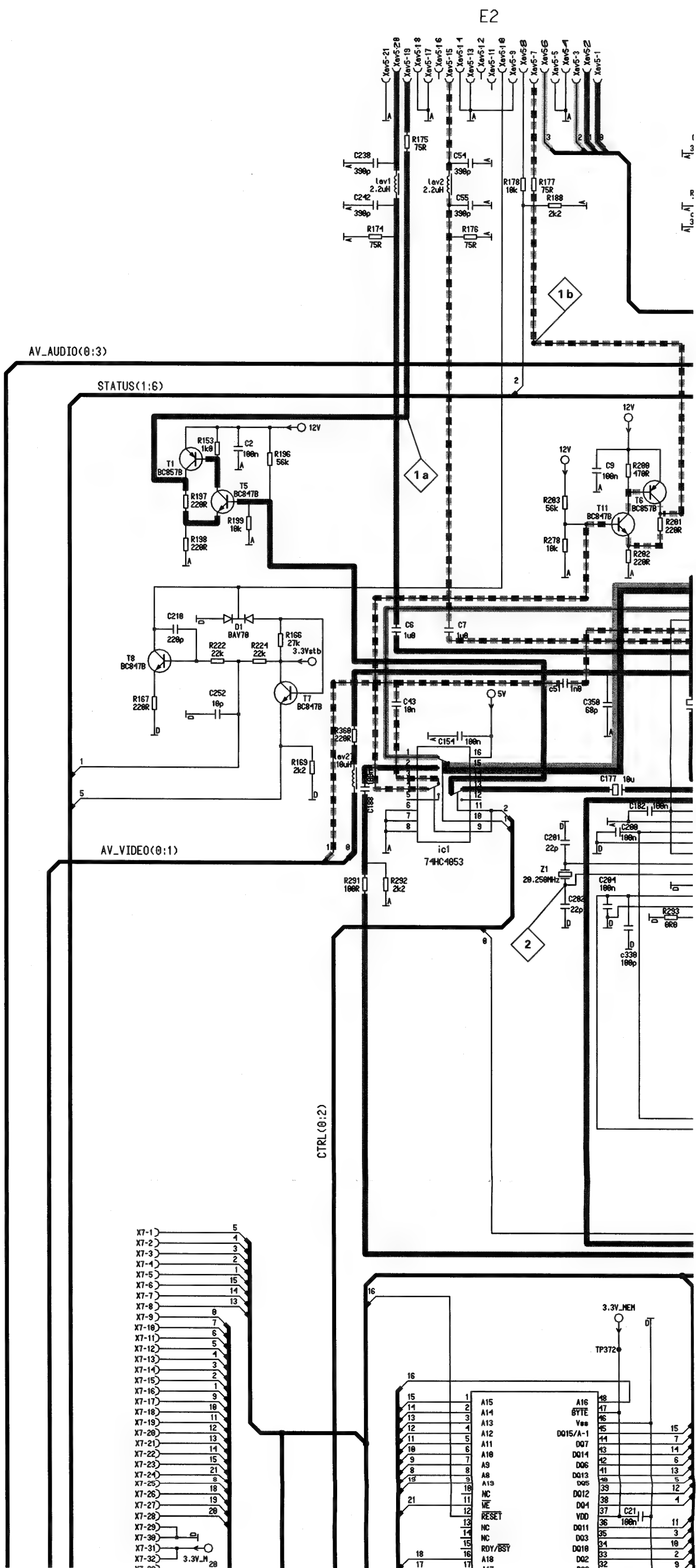
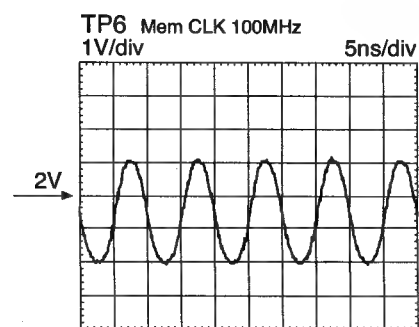
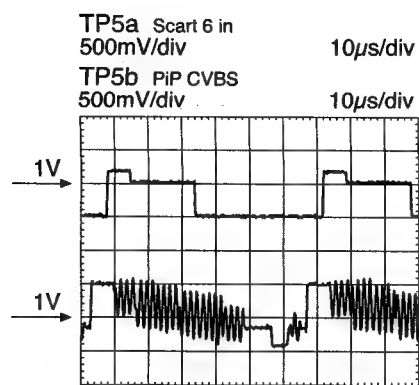
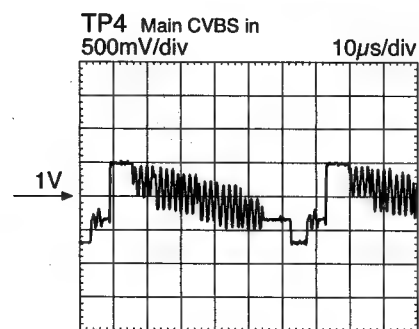
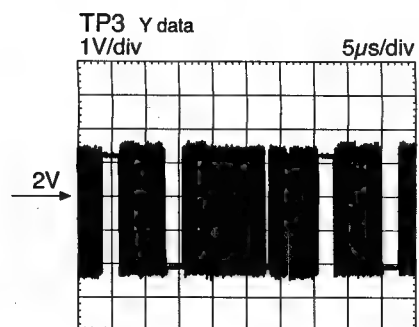
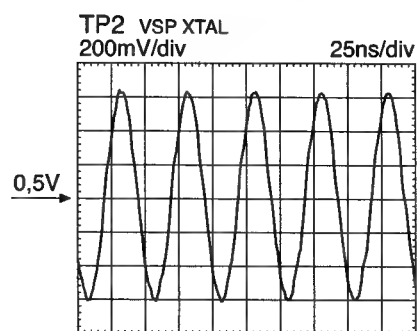
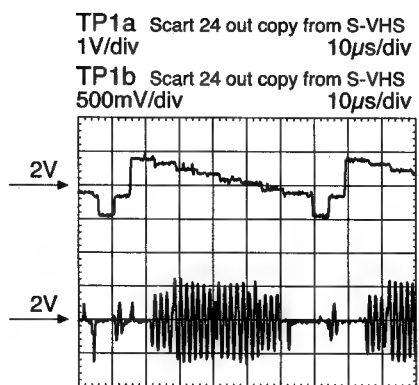


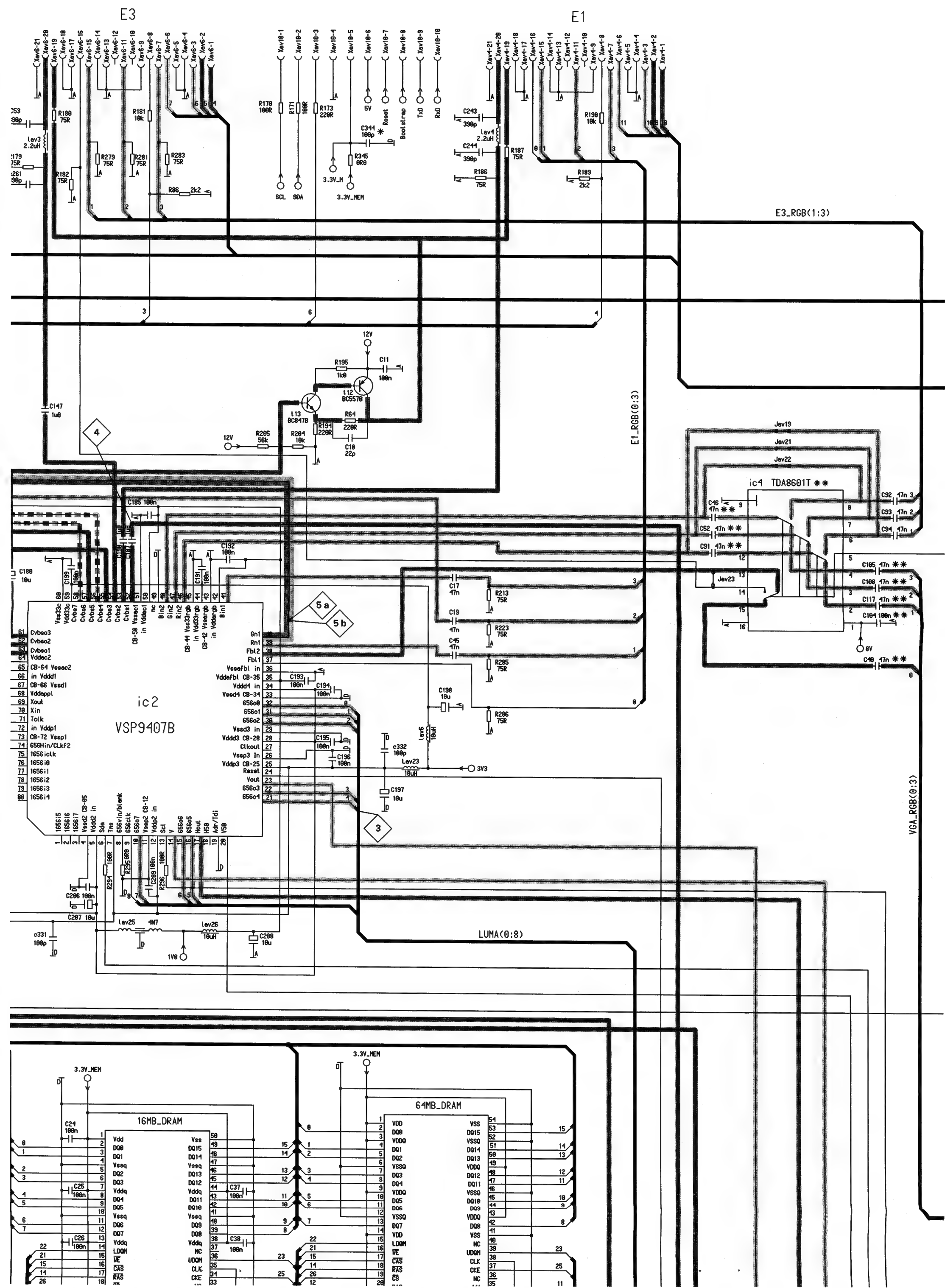
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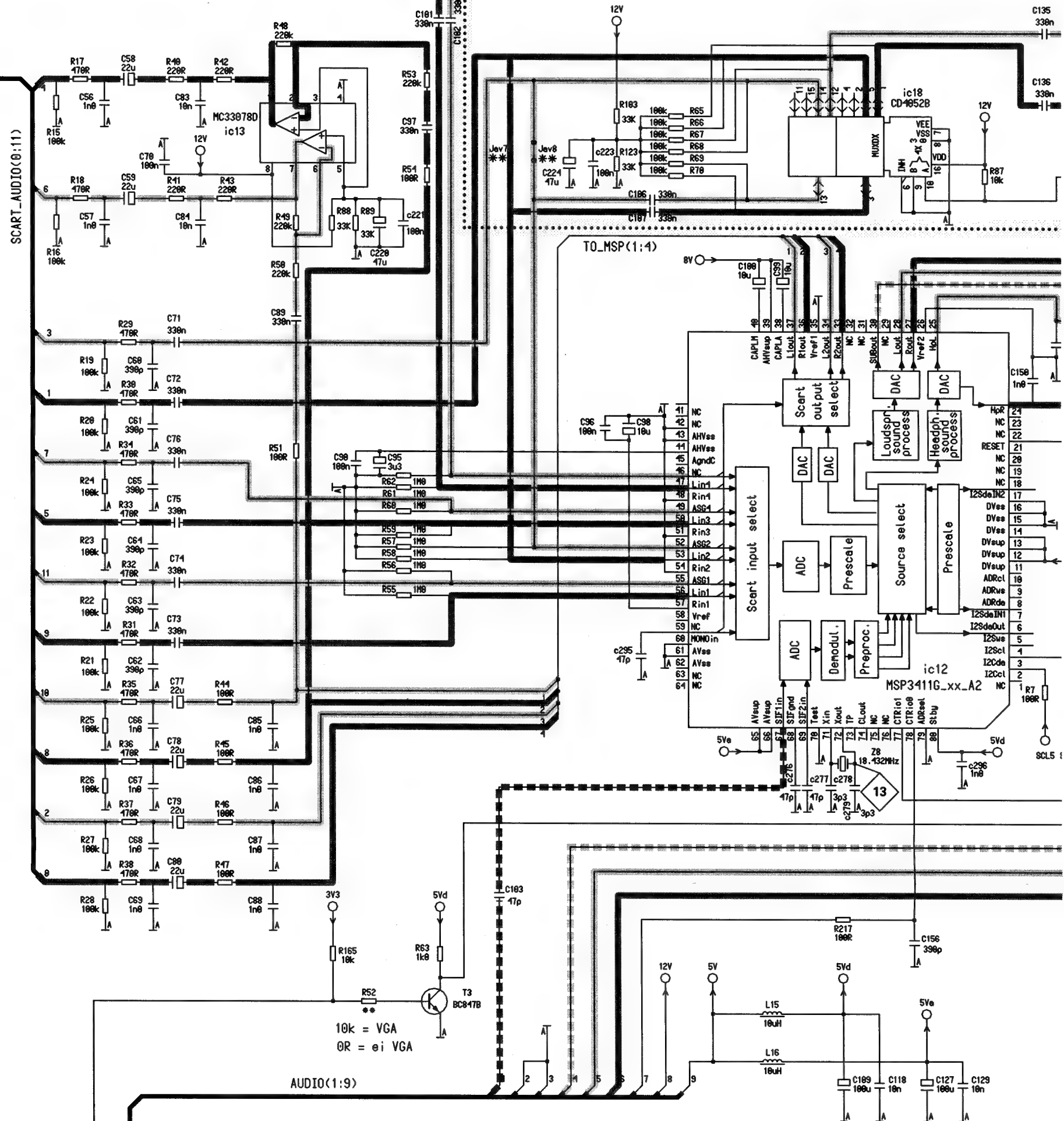
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1234567890  
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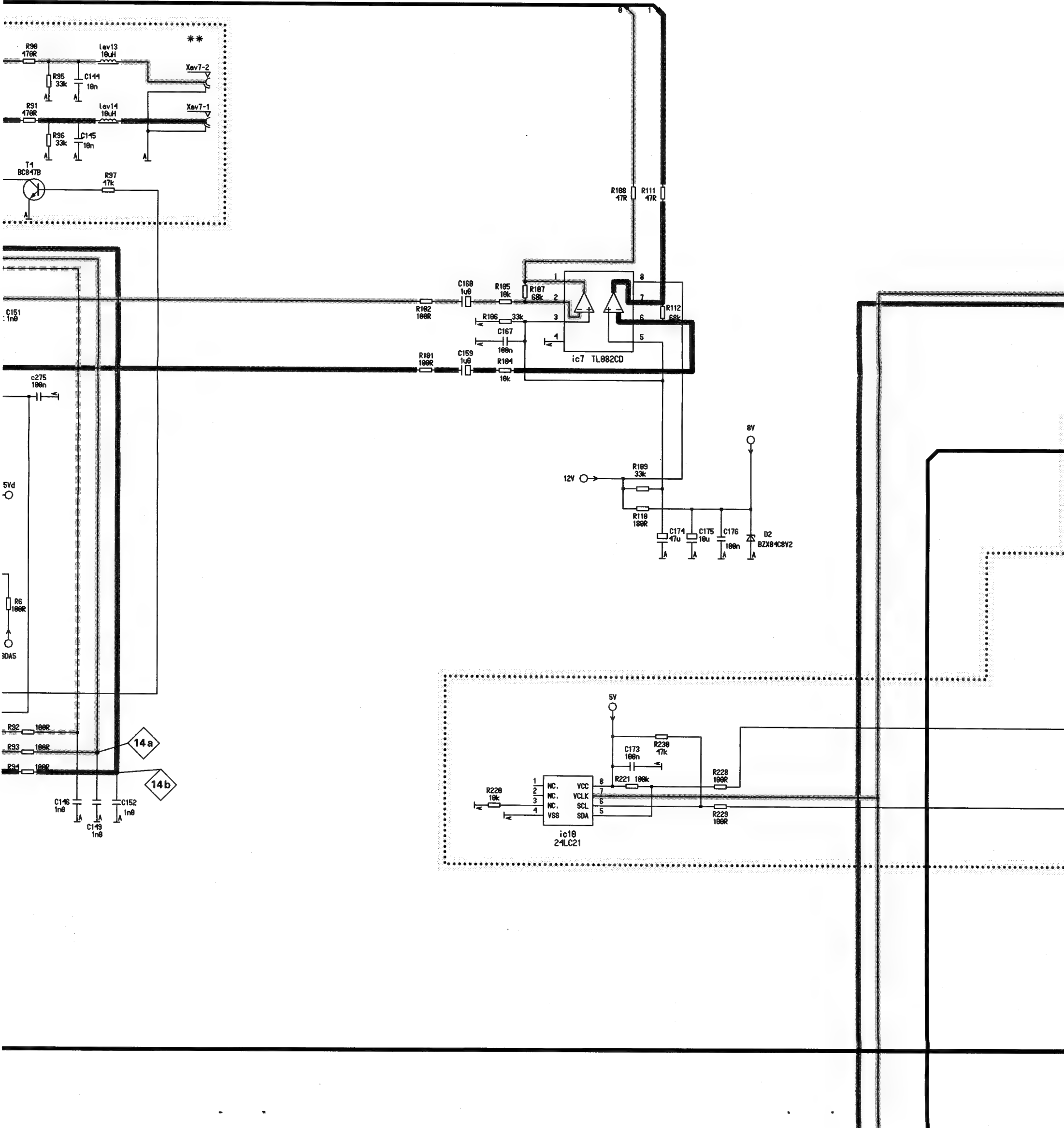


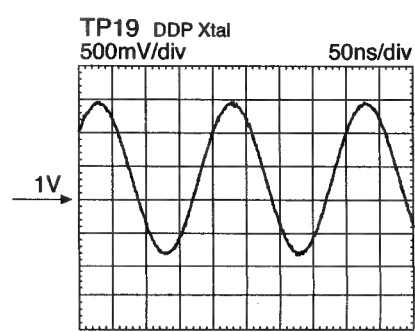
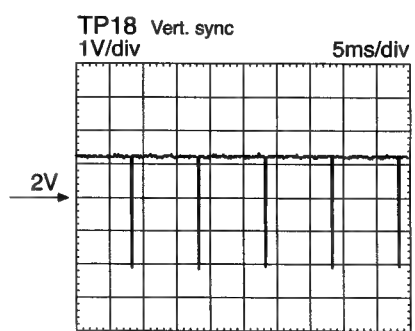
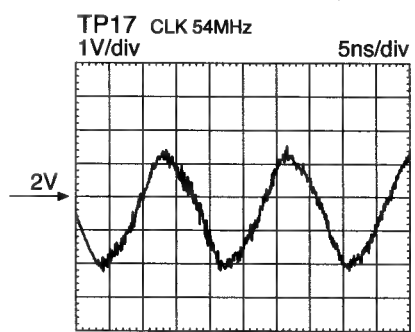
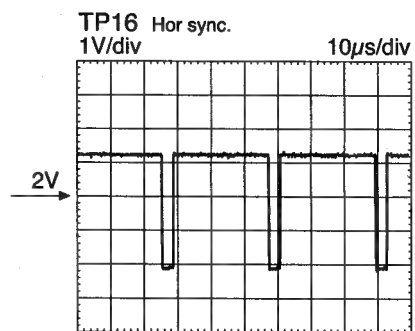
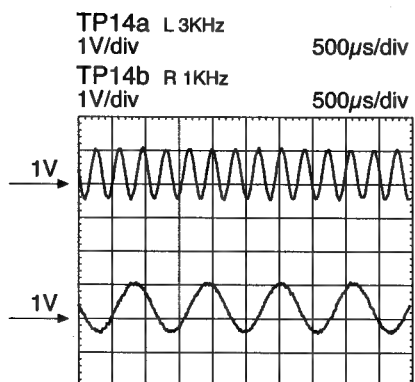
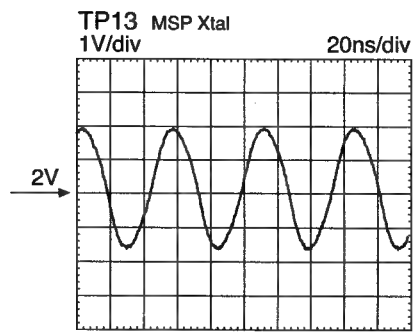
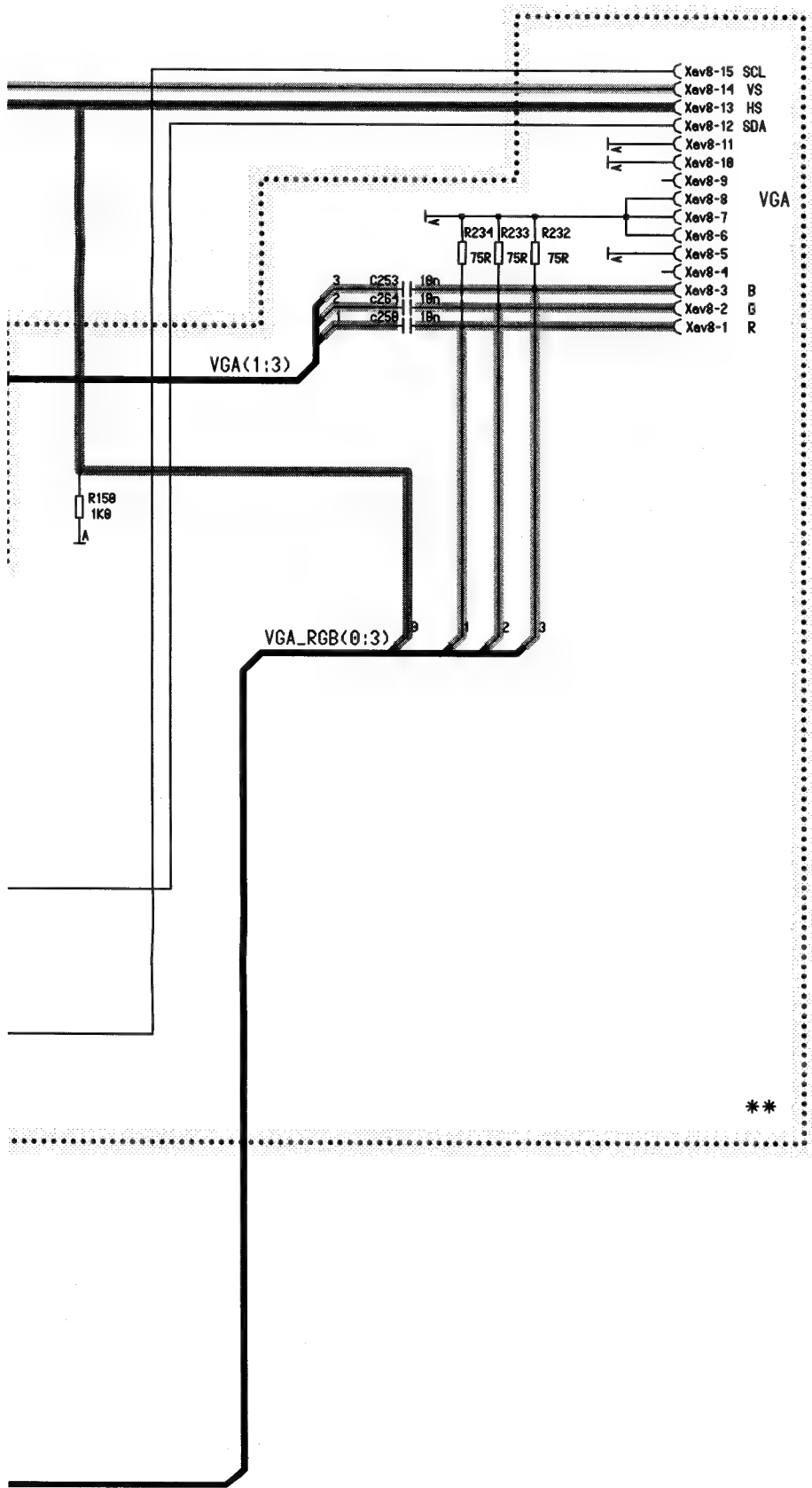


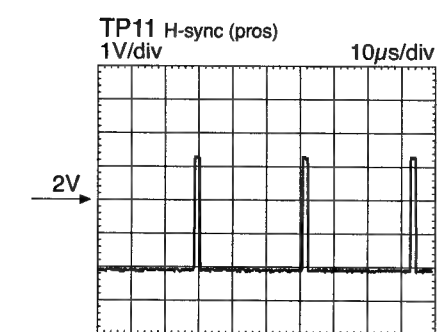






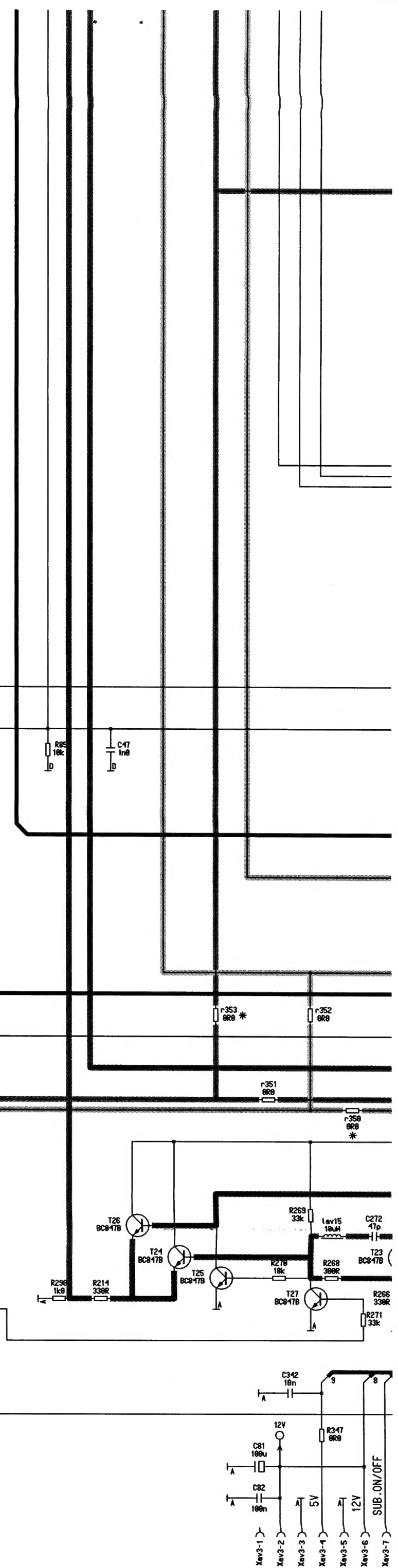


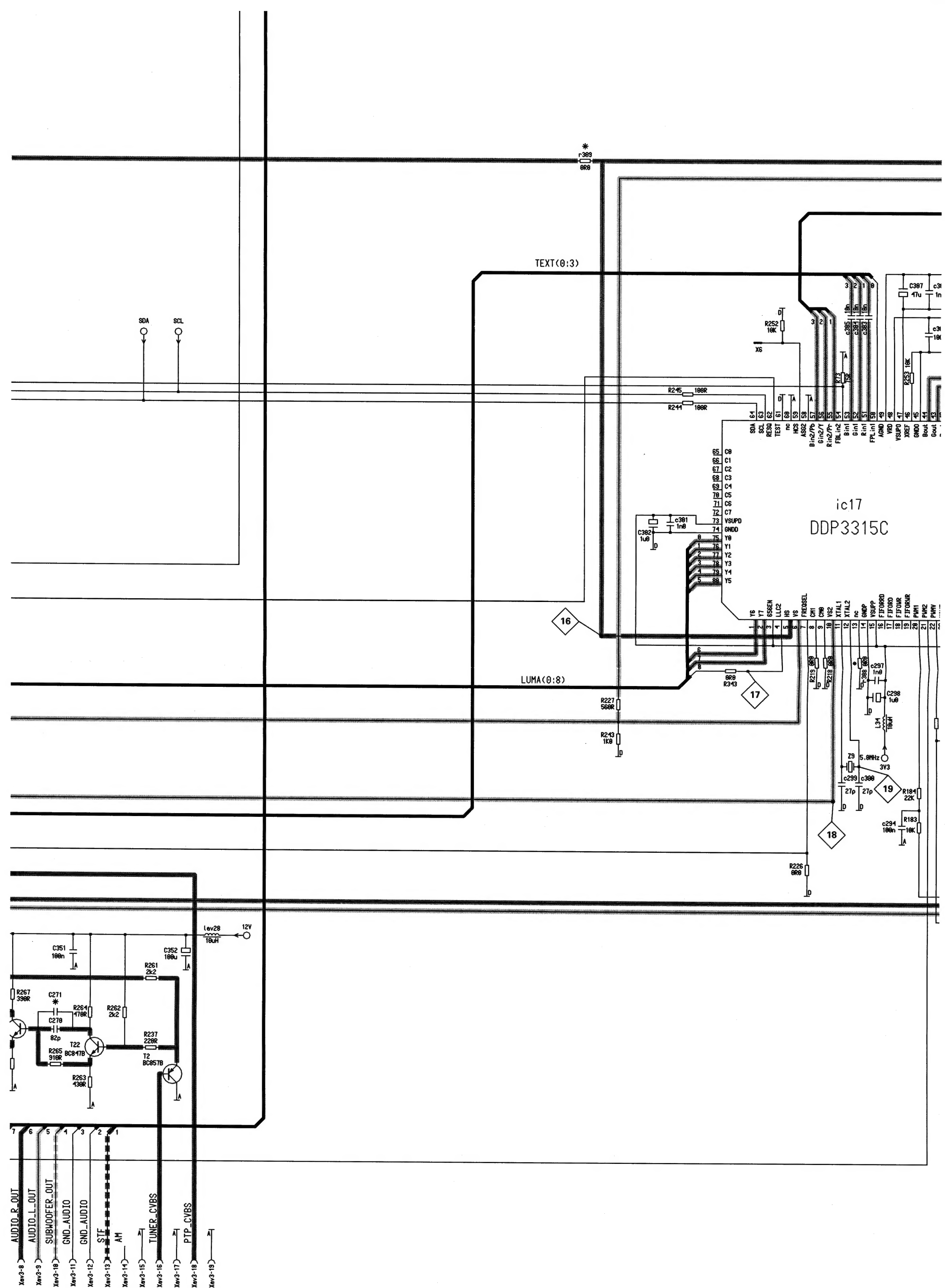


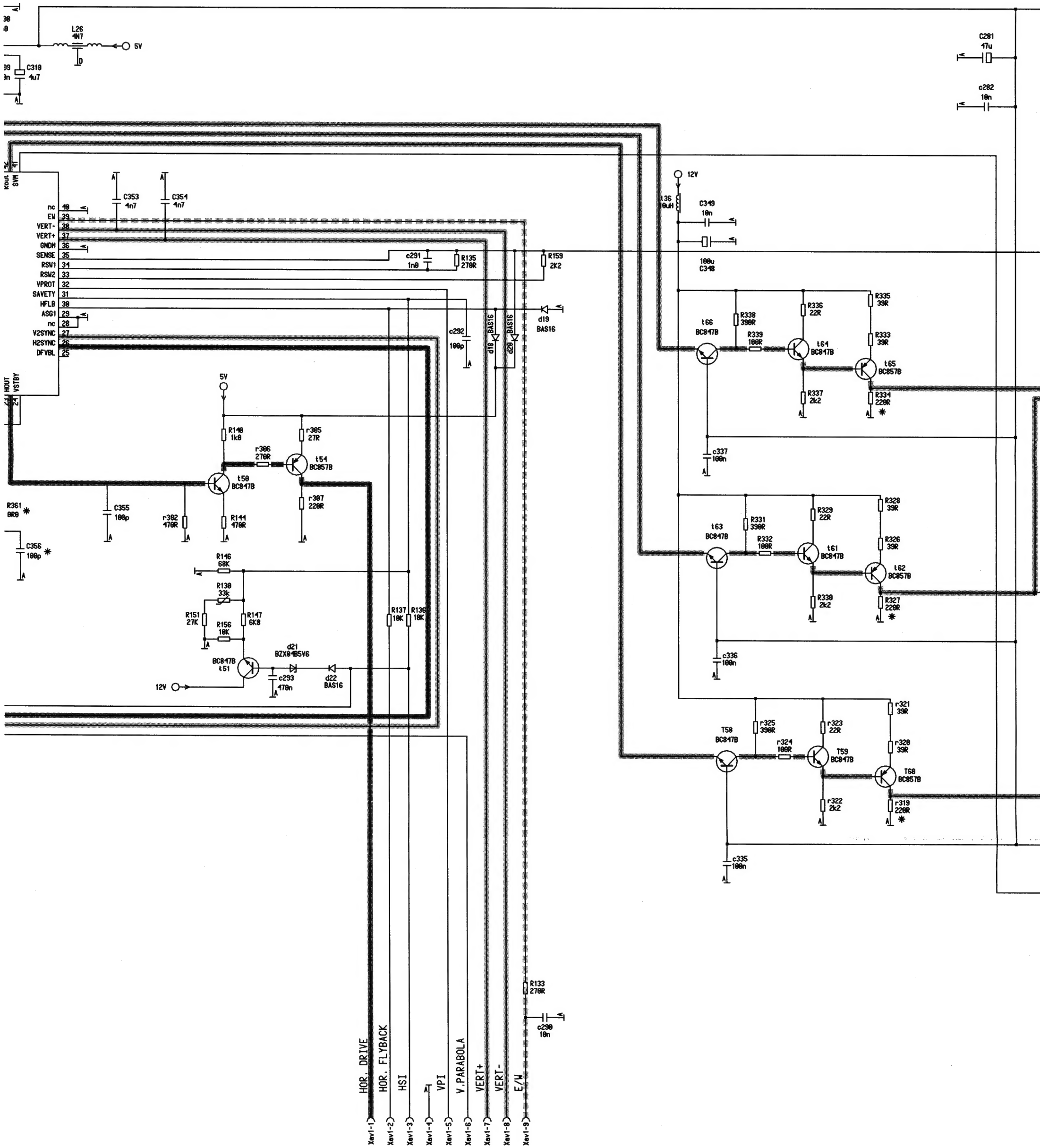


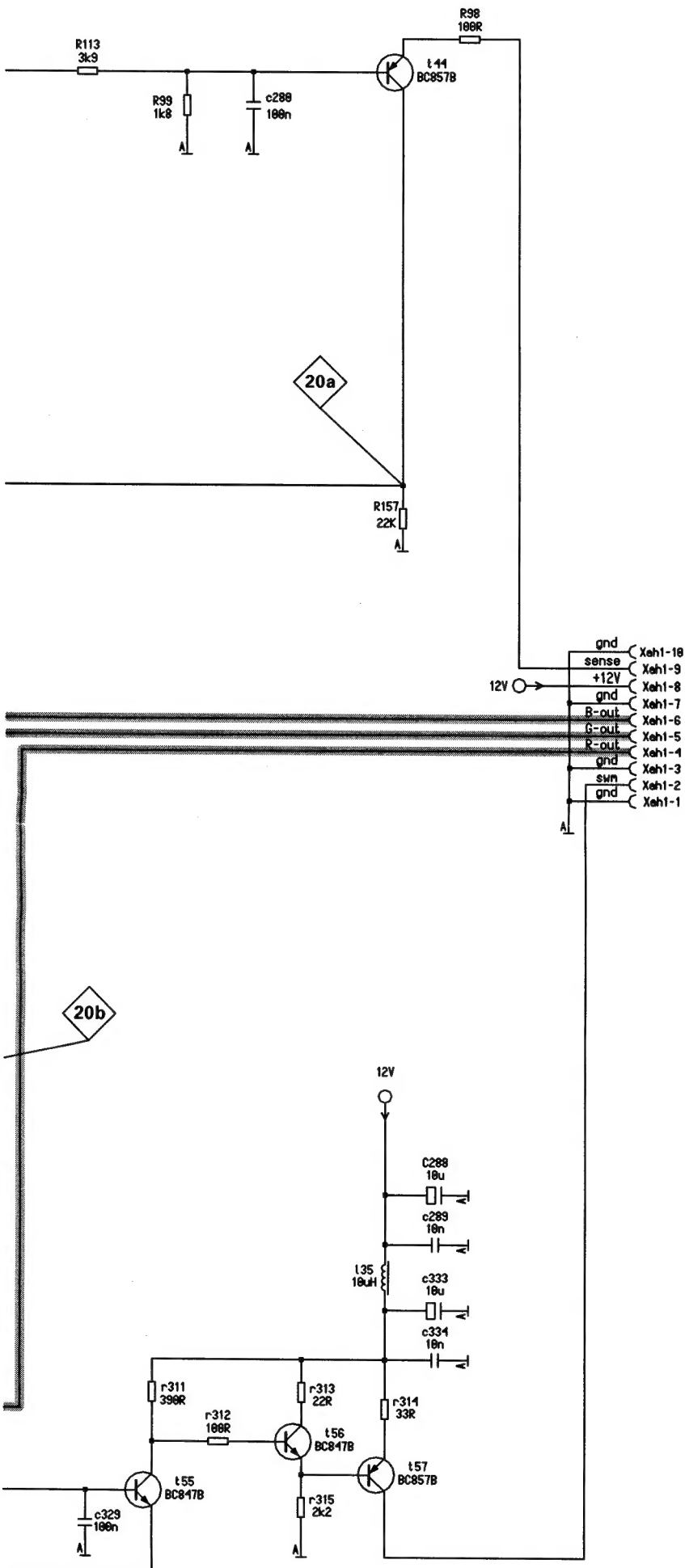
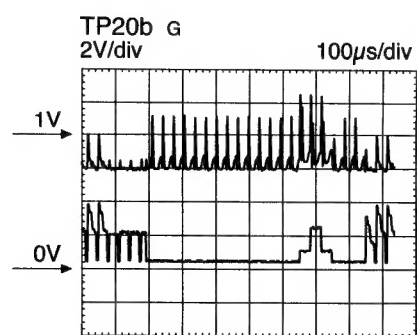
136  
4











\* not used  
 \*\* version component  
 ⚠ safety component, must be replaced only with original parts.

- Video signal (CVBS or Y)
- - - - Chroma signal
- - - - Sound IF signal
- Audio signal (L)
- Audio signal (R)
- - - - Subwoofer signal
- RGB or UV signal
- Horizontal deflection signal
- Vertical deflection signal
- - - - E-W raster correction signal